

# REMEDIAL ACTION CONTRACT

United States Environmental Protection Agency Region 6

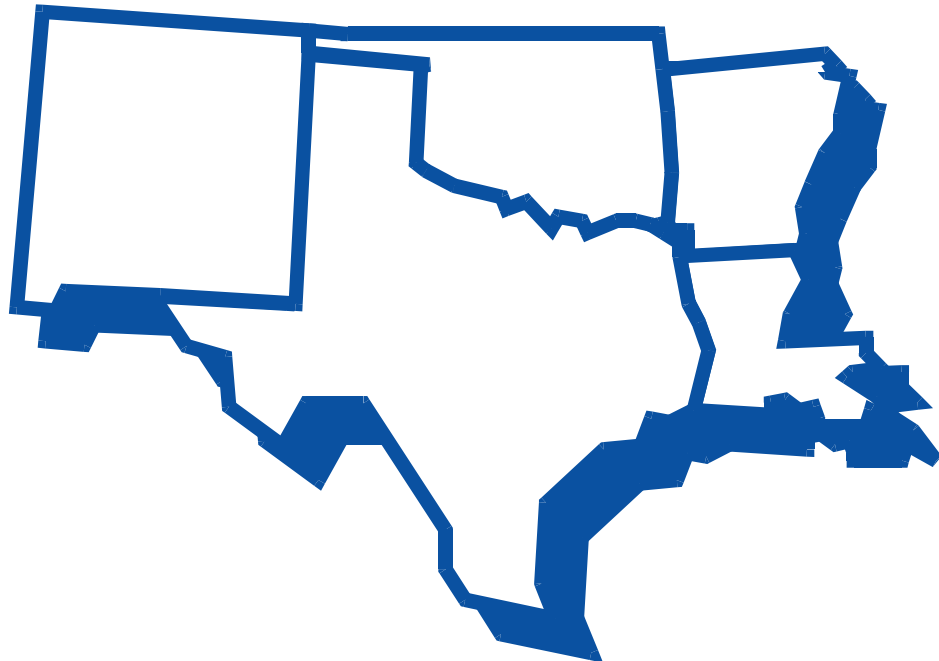
Contract No. EP-W-06-21



**Version 1.0  
Field Sampling Plan  
Tulsa Fuel and Manufacturing  
Superfund Site  
Collinsville, Oklahoma**

**Remedial Action Contract No. EP-W-06-21  
EPA Task Order 0030-RIRI-06FP**

**November 2007**



**Version 1.0**

**Supplemental Remedial Investigation/Feasibility  
Study  
Field Sampling Plan**

**Tulsa Fuel and Manufacturing  
Tulsa County, Oklahoma**

**Response Action Contract No. EP-W-06-021  
EPA Work Assignment No. 0030-RIRI-06FP  
CH2M HILL Project Number: 365672  
DCN 0030-02000**

**Prepared for  
U.S. Environmental Protection Agency  
Region 6**

**Prepared by  
CH2M HILL, INC.  
November 2007**

[This page intentionally left blank.]

# Table of Contents

---

<b>Table of Contents.....</b>	<b>i</b>
<b>Acronym List .....</b>	<b>iii</b>
<b>1.0 Introduction .....</b>	<b>1-1</b>
1.1 Purpose .....	1-1
1.2 FSP Organization .....	1-1
1.3 Project Team .....	1-2
1.4 Project Schedule .....	1-2
<b>2.0 Site Background.....</b>	<b>2-3</b>
2.1 Site Description.....	2-3
2.2 Site Investigation History .....	2-4
<b>3.0 Objectives and Overview of Field Activities.....</b>	<b>3-1</b>
3.1 Project Objectives .....	3-1
3.2 Data Quality Objectives .....	3-1
3.3 Field Activity Summary .....	3-1
<b>4.0 Detailed Description of Field Activities .....</b>	<b>4-1</b>
4.1 Field Investigation Preparations .....	4-1
4.1.1 Access Agreements .....	4-1
4.1.2 Mobilization/Demobilization .....	4-2
4.1.3 Field Activity Preparations.....	4-2
4.1.4 Sampling Equipment .....	4-3
4.2 Airborne Dispersion Soil Sampling .....	4-3
4.3 Residential Soil Sampling.....	4-4
4.4 Sample Location Survey .....	4-5
4.5 Sample Analysis .....	4-6
4.6 Field Quality Control Sample Collection and Analysis.....	4-6
<b>5.0 Decontamination and Waste Management Procedures .....</b>	<b>5-1</b>
5.1 Equipment Decontamination .....	5-1
5.2 Management of Investigation-Derived Waste .....	5-1
<b>6.0 Sample Handling and Custody.....</b>	<b>6-1</b>
6.1 Sample Containers and Preservatives .....	6-1
6.2 Sample Labeling and Identification .....	6-1
6.2.3 Split and Independent Sample IDs and Station IDs .....	6-2
6.2.4 Field Quality Control Samples .....	6-2
6.3 Sample Handling, Chain of Custody, and Sample Shipping .....	6-3
<b>7.0 Property Control and Field Documentation .....</b>	<b>7-1</b>
7.1 Property Control .....	7-1
7.2 Log Books and Daily Reports.....	7-1
7.2.1 Field Log Books .....	7-1
7.2.2 Field Sampling Forms .....	7-3
7.2.3 Daily Reports.....	7-3
7.3 Photographs .....	7-3
7.4 Chain of Custody Records .....	7-4
7.5 Packaging and Shipment Documentation .....	7-4
<b>8.0 Data Management.....</b>	<b>8-1</b>
8.1 Sample Management.....	8-1
8.1.1 CLP Laboratory Data Sample Management.....	8-1
8.1.2 Non-CLP Laboratory Data Sample Management .....	8-2

8.1.3	Other Data Management.....	8-2
8.2	Sample Data Transfer .....	8-2
8.2.1	CLP Laboratory Data Transfer .....	8-2
8.2.2	Non-CLP Laboratory Data Transfer.....	8-3
8.2.3	Other Data Transfer.....	8-3
8.3	Sample Data Storage.....	8-3
8.3.1	CLP Laboratory Data Storage .....	8-3
8.3.2	Non-CLP Data Storage Management.....	8-4
8.3.3	Other Data Storage .....	8-4
8.4	Data Evaluation.....	8-4
8.4.1	Data Validation.....	8-4
8.4.2	Technical Evaluation .....	8-5
8.5	Data Reporting.....	8-6
<b>9.0</b>	<b>References.....</b>	<b>9-1</b>

## List of Figures

Figure 1-1	Site Map
Figure 1-2	Organization Chart
Figure 1-3	Project Schedule
Figure 3-1	Investigation Area

## List of Appendices

Appendix A	CH2M HILL Field Sampling Forms
Appendix B	CH2M HILL Property Management Guidelines
Appendix C	EPA Property Access Agreement

# Acronym List

---

ASTM	American Society for Testing and Materials
bgs	below ground surface
CLP	Contract Laboratory Program
COC	Chain of Custody
DMP	Data Management Plan
DOT	Department of Transportation
DQO	Data Quality Objective
EB	equipment duplicate
EDD	electronic data deliverable
EPA	Environmental Protection Agency
FAR	Federal Acquisition Regulation
FSP	Field Sampling Plan
FTL	Field Team Leader
GPS	global positioning system
HSP	Health and Safety Plan
IDW	Investigation-Derived Waste
LAN	local area network
MS/MSD	matrix spike/matrix spike duplicate
ODEQ	Oklahoma Department of Environmental Quality
PC	Project Chemist
PCR	Property Control Representative
PDM	Project Data Manager
PM	Project Manager
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RI	Remedial Investigation
RSCC	Regional Sample Control Coordinator
SAP	Sampling and Analysis Plan
SampleID	Sample Identification Number
SDG	sample delivery group
SMO	Sample Management Office
StationID	station identification number
TCLP	toxicity characteristic leaching procedure
TFM	Tulsa Fuel and Manufacturing
TOM	Task Order Manager
TR	Traffic Report

[This page intentionally left blank.]

# 1.0 Introduction

---

This Field Sampling Plan (FSP) was prepared for the U.S. Environmental Protection Agency (EPA) in support of the Supplemental Remedial Investigation (RI) activities related to the Tulsa Fuel and Manufacturing (TFM) Superfund Site. The TFM Site is located south of the City of Collinsville, Oklahoma, in Tulsa County ([Figure 1-1](#)). CH2M HILL has been tasked to collect shallow surface soil samples from offsite properties in the vicinity of the TFM Site, in order to assess the potential for soil contamination due to aerial dispersion of site contaminants from past site smelter activities and to assess the extent of offsite use of site waste materials as fill material. The Supplemental RI field activities will be performed as documented in this FSP and in the EPA-approved project Work Plan (WP), dated 17 October 2007.

This FSP includes applicable procedures, forms, and guidelines for the performance of the field activities specified in this plan. This document together with the Quality Assurance Project Plan (QAPP) constitutes the Sampling and Analysis Plan (SAP) for this work. The QAPP is provided as Volume II of the SAP. The SAP components will be used in conjunction with the Health and Safety Plan (HSP), to be provided under separate cover, to describe the procedures to be used during the performance of these field activities at the Site.

Several tasks described in this FSP are dependent on the activities of other entities, decisions that will be made during field activities, and/or decisions that will be made at other times during the life-cycle of this project. Therefore this FSP is intended to be a dynamic and flexible document that may be modified to meet the requirements of the project.

## 1.1 Purpose

This FSP has been prepared to describe the methods and procedures to be used during implementation of the Supplemental RI field sampling activities. The objectives for the field investigation and a list of the sampling activities to be conducted in support of these objectives are provided in [Section 3](#).

## 1.2 FSP Organization

[Section 1](#) of this FSP is the introduction. [Section 2](#) gives a brief description of the Site background and history. [Section 3](#) describes the field investigation objectives and summarizes the field investigation activities. [Section 4](#) provides a detailed description of the field investigation activities.



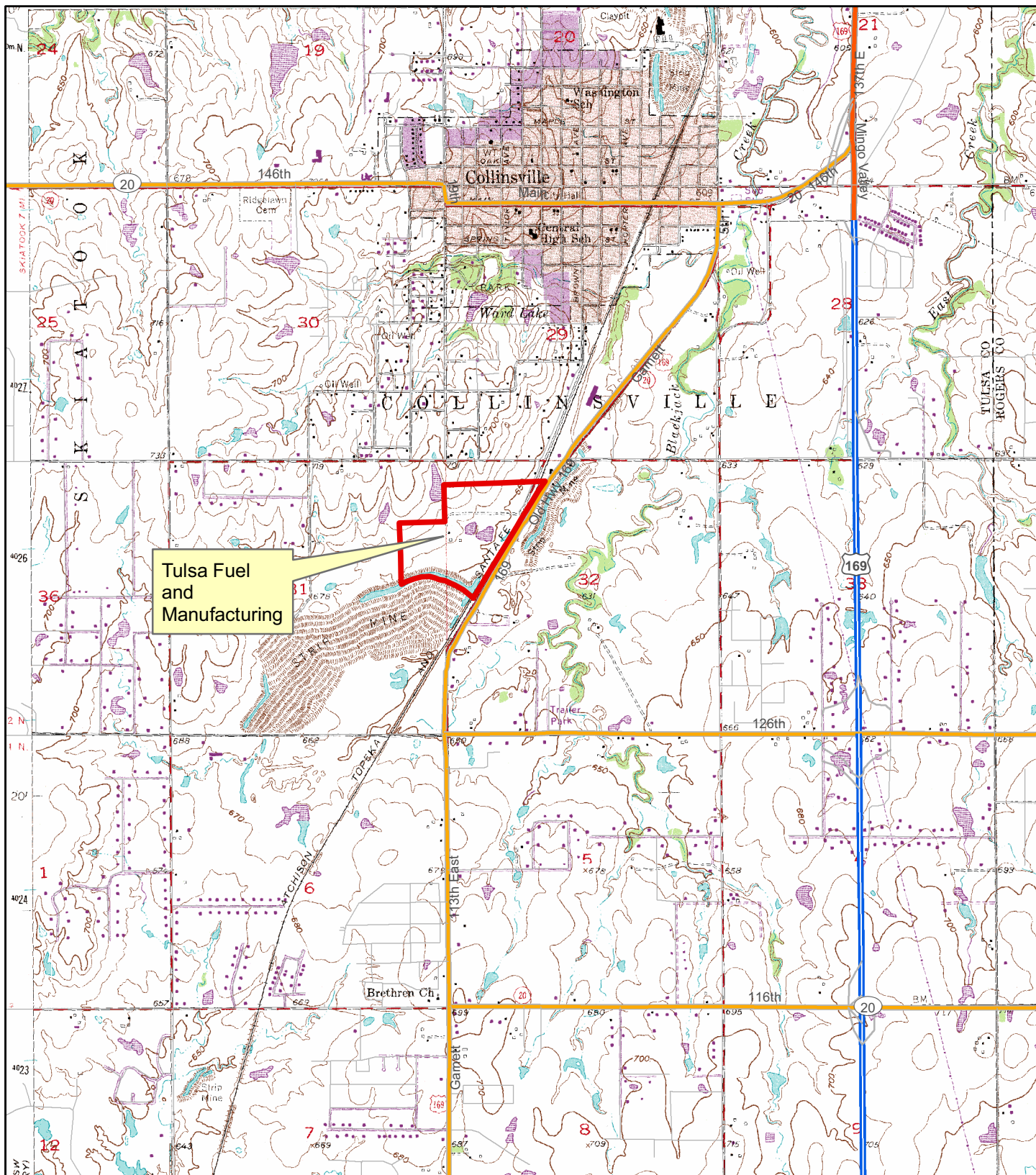
**Section 5** details the decontamination and waste management procedures. **Section 6** describes sample handling and analysis. **Section 7** lists the procedures for property control and field documentation. **Section 8** lists the references used in preparing this document.

## 1.3 Project Team

**Figure 1-2** lists the project team organization and its roles. A full description of staff and their project responsibilities is presented in the QAPP. The QAPP is presented as Volume II of the SAP and should be used in conjunction with this plan.

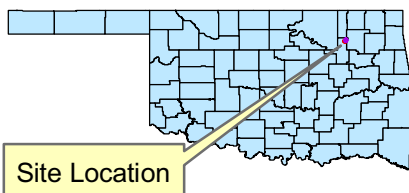
## 1.4 Project Schedule

The project schedule is provided in **Figure 1-3**. Refinements to the schedule are likely and will be communicated by the Project Manager (PM) to EPA and the field team via project instruction updates.



Tulsa Fuel  
and  
Manufacturing

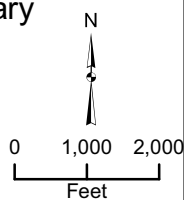
Key Map



### Legend

Site Boundary

Source: USGS 7.5 Minute  
Topographic Map,  
Collinsville, Oklahoma.



**Figure 1-1  
SITE LOCATION MAP**

TULSA FUEL AND MANUFACTURING  
Collinsville, OK



**CH2MHILL**

**Figure 1-2**  
**Project Team Organizational Chart**  
**Tulsa Fuel and Manufacturing**  
**Supplemental Remedial Investigation/Feasibility Study**

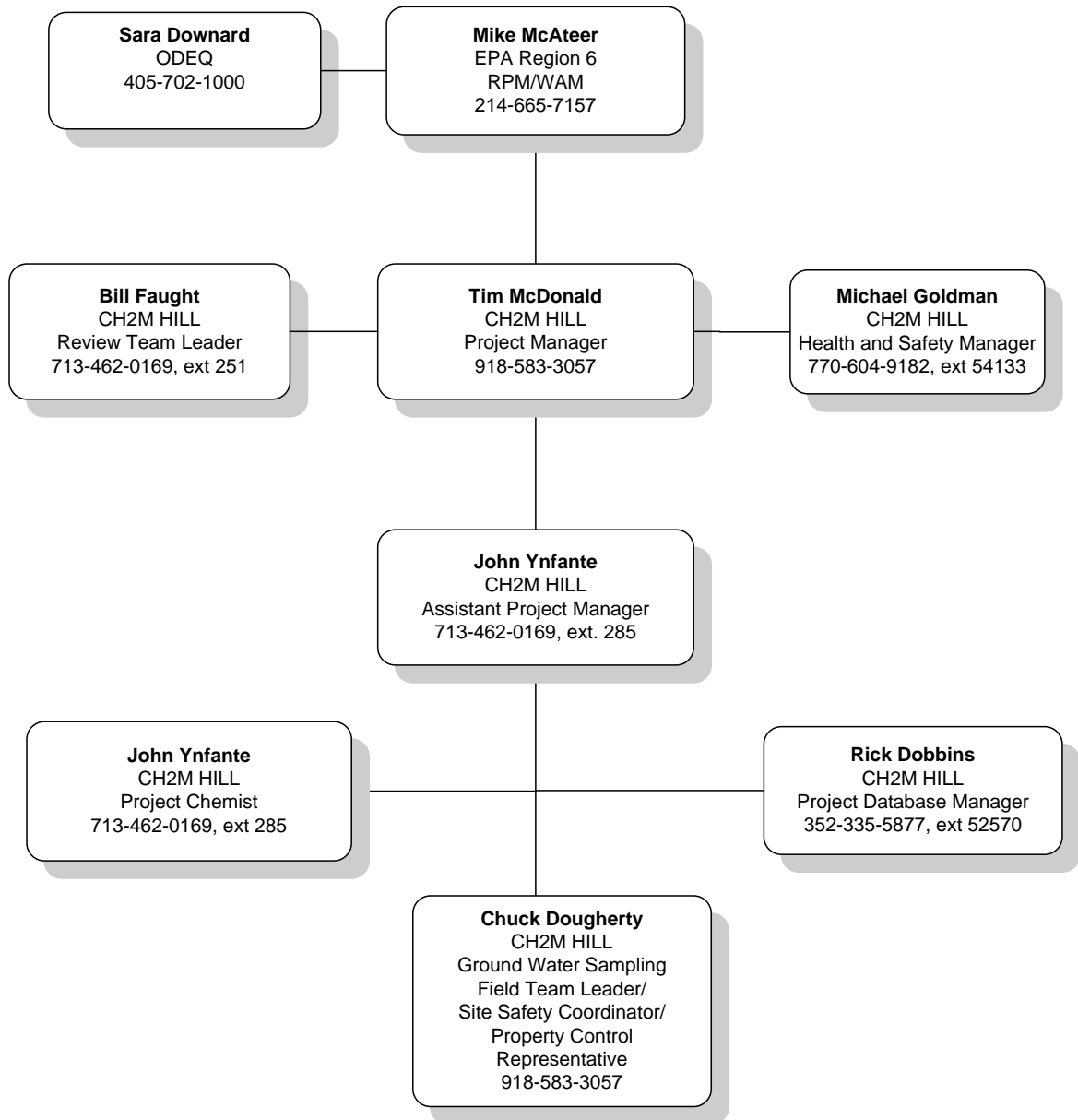
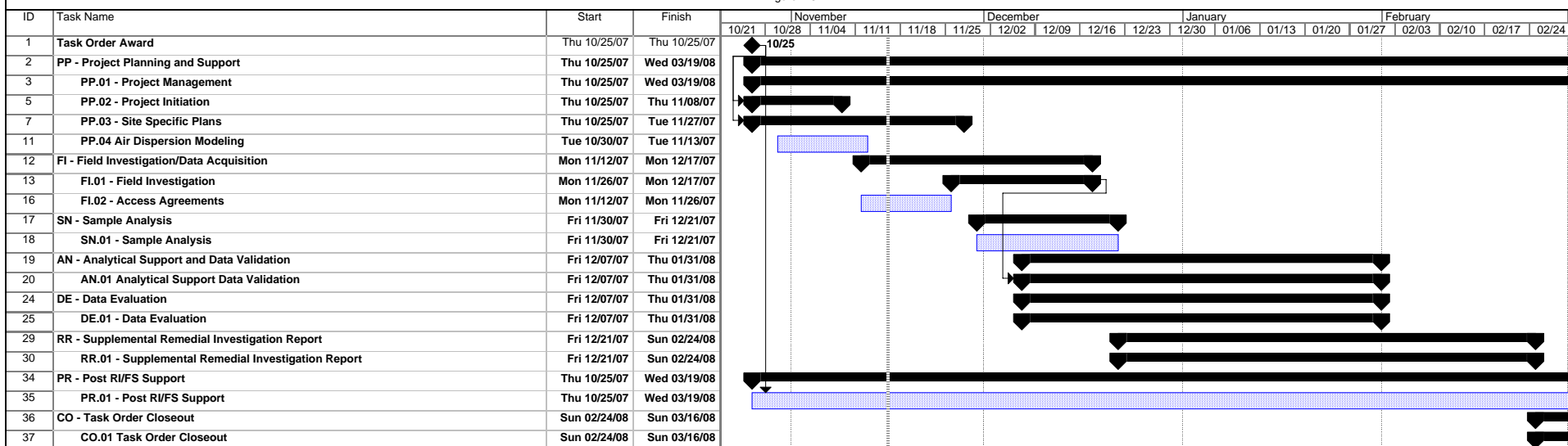


Figure 1-3



Contract No. EP-W-06-021  
 Project: Tulsa Fuel and Manufacturing  
 Date: Fri 11/16/07

Task



Progress



Summary



External Tasks



Deadline



Split



Milestone



Project Summary



External Milestone



[This page intentionally left blank.]

## 2.0 Site Background

---

This section provides a brief description of the Site. Additional background information about the Site, including a brief regulatory history and an overview of physical characteristics and site geologic conditions, can be found in the RI Report (Burns & McDonnell, 2007).

### 2.1 Site Description

The TFM is a former zinc smelting and lead roasting facility located approximately 1.3 miles south of the City of Collinsville, Oklahoma, and covers about 60 acres. The Site is bordered on the south by a former strip mine impoundment, on the north and west by agricultural properties, and on the east by “old” US Highway 169 and the right of way for the Burlington Northern Santa Fe railroad. Faith Assembly Church is also located adjacent to the north of the TFM Site.

The TFM facility was operational from 1914 through 1925. The smelting operation utilized nine furnaces, a kiln, condensers, and a laboratory. The majority of site structures have been demolished but many foundations and building footings remain. Large amounts of ore were stored onsite, northeast of the operations area. Portions of the site are currently covered with waste consisting of broken retorts and condensers, slag, building debris, ash, bricks, and other materials from the former smelting operations.

A residence was present onsite from 1935 through February 2002, when it was destroyed by fire. A garage and a few storage sheds remain in place adjacent to the former residence. A water well associated with the residence remains onsite, but is no longer used.

Previous investigations indicate that the TFM Site is underlain by unconsolidated overburden consisting of silt, clay, silty loam, and shale residuum. Bedrock was encountered at depths ranging from 7.2 feet to 12.5 feet below ground surface (bgs), and consisted primarily of shale, with some sandstone and limestone.

The current investigation is focused on potential impact of offsite properties. Properties surrounding the TFM Site include residential, commercial, agricultural, and rural.

## 2.2 Site Investigation History

Previous investigations of the TFM Site include a Preliminary Assessment by the Oklahoma State Department of Health (now the Oklahoma Department of Environmental Quality [ODEQ]) in 1992, a Site Inspection by the ODEQ in 1994, a USEPA Removal Assessment in 1999, a Public Health Assessment by the Agency for Toxic Substances and Disease Registry in 2000, and an RI by the ODEQ in 2005-2006. The RI included a baseline ecological and human health risk assessment. These investigations indicated the presence of waste materials and elevated metals concentrations at the site, and identified arsenic, cadmium, lead, and zinc as the site contaminants of concern. Details regarding each of these investigations are presented in the RI Report (Burns & McDonnell, 2007). The TFM Site was placed on the EPA National Priority List in January 1999.

## 3.0 Objectives and Overview of Field Activities

---

This section provides a description of the project objectives and an overview of the planned field activities. EPA has tasked CH2M HILL to conduct sampling activities to assess the potential for offsite soil contamination resulting from dispersion of airborne constituents during the operation of the smelters at the TFM Site and from physical transport and placement of site waste materials as fill at offsite locations. The sampling activities primarily include the collection of shallow surface soil samples from offsite locations within approximately 1.5-mile of the TFM Site. The samples will be collected from residential, rural, and agricultural properties. **Figure 3-1** is an aerial photograph showing the TFM Site and the 1.5-mile investigation area.

### 3.1 Project Objectives

The objective of this investigation is to obtain data that is supplemental to the ODEQ RI (2007). The supplemental data will be used to assess the potential for contamination of soils on offsite properties. The field activities required to support these objectives are detailed in this FSP and include the following activities:

- Collect and analyze approximately 10 surface soil samples to assess airborne dispersion of site contaminants during operation of the smelter at the TFM Site
- Collect and analyze approximately 1,200 surface soil samples to assess the extent of usage of site smelter wastes as fill material on offsite properties

### 3.2 Data Quality Objectives

A detailed discussion of data quality objectives (DQOs) is included in the QAPP in Section 1.5 and Table 1-2.

### 3.3 Field Activity Summary

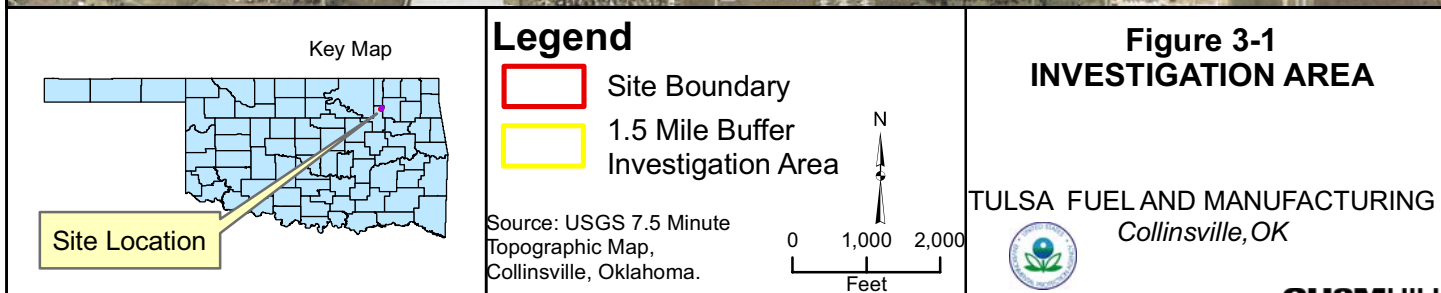
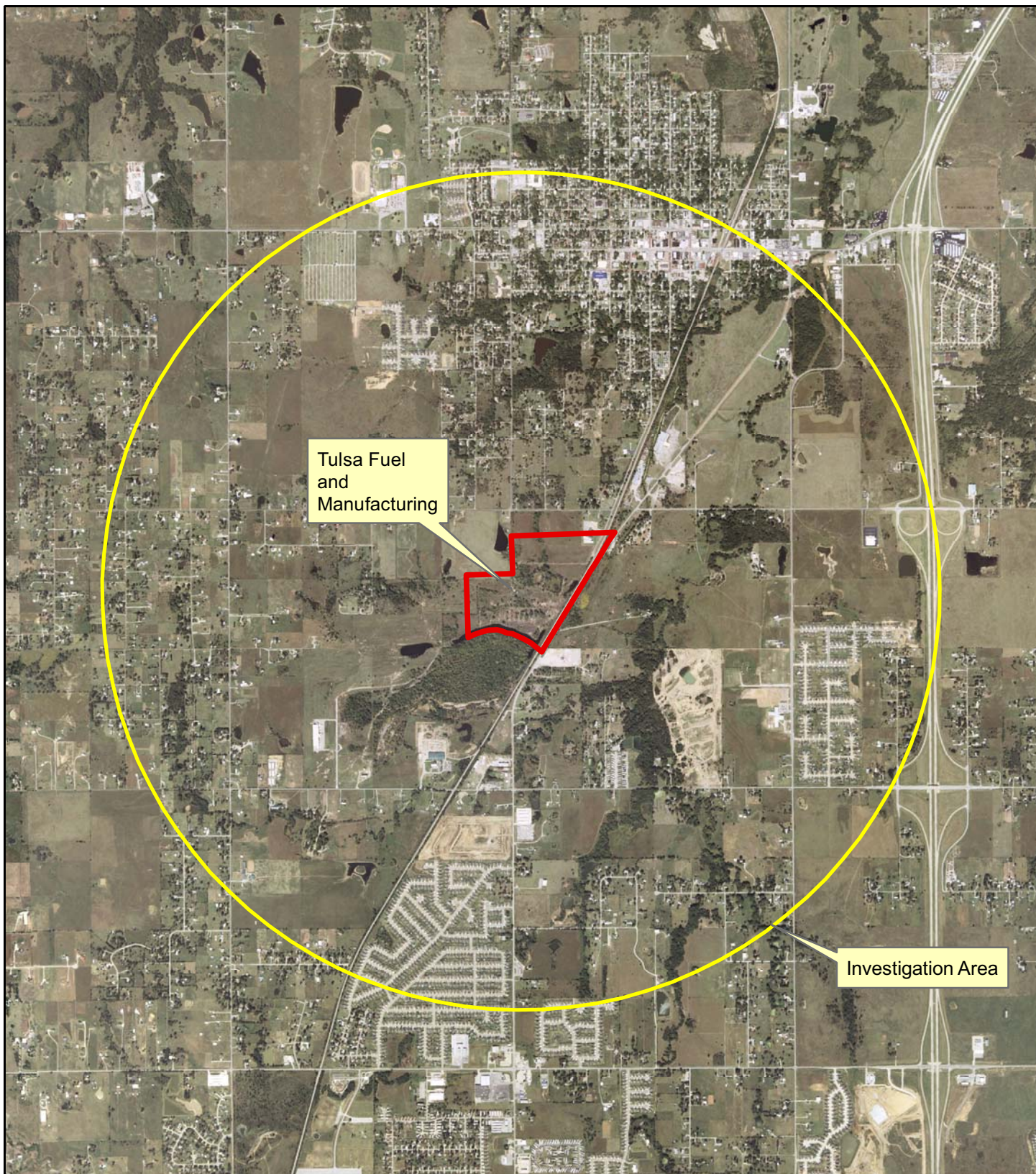
The objectives of the field investigation activities identified in Section 3.1 will be met by the following field activities:

- Obtain access agreements to collect surface soil samples from private properties within the investigation area



- Collect shallow surface soil samples for assessment of impact due to airborne dispersion of site contaminants from site smelter activities, and
- Collect shallow surface soil samples for assessment of the potential for physical transport of site wastes to offsite properties for fill material or other use

Specific methods and procedures to perform these field activities are provided in the following sections of this FSP.



[This page intentionally left blank.]



## 4.0 Detailed Description of Field Activities

---

This section provides a detailed description of the field activities to be conducted that are associated with the Supplemental RI for the TFM Site, including field investigation preparations, soil sampling, investigation-derived waste sampling, and field quality control samples.

During sampling, descriptive details regarding each sample location and the sampling procedures will be recorded in the field logbook and on Sample Collection sheets provided in [Appendix A](#) in accordance with the requirements presented in [Section 7](#). Photographs will also be taken to document sample locations. Details of sampling procedures, management of Investigation-Derived Waste (IDW), and other field-related activities are provided in following sections.

Laboratory analytical methods are also discussed briefly below; a more detailed description of analytical methods can be found in the QAPP in Section 2.4 and Tables 2-1, 2-2, and 2-3.

### 4.1 Field Investigation Preparations

This section describes the activities to be conducted in preparation for the field sampling effort.

#### 4.1.1 Access Agreements

Access agreements will be required prior to entry onto any private property for the purpose of collecting soil samples. A limited number of access agreements have been obtained by ODEQ during the previous investigation activities and the ongoing outreach program. CH2M HILL will attempt to acquire an access agreement for target properties if an access agreement is not yet available. Property owners who are to be contacted for access will be identified primarily through either response to notices published by ODEQ in the local newspaper requesting voluntary public participation in the sampling program, or by direct contact with property owners within the investigation area.

Specific properties at which an access agreement will be sought include: the Faith Assembly Church, located near the gate to the TFM Site; properties east of the railroad tracks, to be identified by ODEQ; and other properties whose residents have contacted ODEQ directly and requested sampling. All properties to be investigated will be within approximately 1.5 miles of the TFM Site.

A copy of the access agreement to be used for the TFM Site is provided in [Appendix C](#). If a property owner will not grant access, an alternative sampling location will be sought. Sampling locations at properties for which access agreements have been obtained will be submitted to EPA for approval

prior to initiation of field work. It is anticipated that not all necessary access agreements will be in place at the beginning of field work. As additional agreements are obtained, updated sampling locations will be forwarded to EPA for approval.

#### **4.1.2 Mobilization/Demobilization**

Preparation for the field effort and mobilization of field staff and equipment will include the identification, procurement, shipment, delivery, and set-up of all material, equipment, and labor necessary to conduct the field activities. The existing CH2M HILL Tulsa office, located approximately 15 miles from the TFM Site, will serve as a base of operations for storage of investigation equipment and materials. The TFM Site will be used for storage of IDW.

All necessary equipment and supplies will be shipped to the CH2M HILL's Tulsa office the week before the sampling effort. Although the use or leasing of government-owned property is not anticipated for this project, if it is required then the government property management procedures will be used to track the receipt and maintenance of all government-owned and leased material acquired during the project. Property control is further discussed below in [Section 7.1](#).

Demobilization activities will include restoration of the individual sampling locations, removal of all temporary facilities, and disposition of all project-acquired and leased materials and equipment, as required under the CH2M HILL property management guidelines.

#### **4.1.3 Field Activity Preparations**

The field-team leader (FTL) will prepare for field activities, in general, and prepare individual work sites for sampling activities, with the assistance of applicable field staff. These preparations will include:

- Holding a kick-off meeting with field staff to review the Site HSP, the roles and responsibilities of each team member, work schedules, work procedures, and conditions potentially triggering work procedure or personal protective equipment changes
- Designation of an IDW staging area at the TFM Site
- Inventory of laboratory supplied sample bottles to confirm sufficient supply for planned sampling
- Identification of properties to be sampled during the field activities, based upon access agreements obtained

#### 4.1.4 Sampling Equipment

Sampling equipment to be used during the investigation includes, but is not limited to:

- Stainless steel trowels, scoops, or spoons
- Stainless steel hand augers
- Stainless steel bowls
- Coolers
- Sample collection containers
- Sealing plastic bags, disposable sampling gloves, plastic sheeting, aluminum foil, and other miscellaneous items

## 4.2 Airborne Dispersion Soil Sampling

The intent of the aerial dispersion sampling activities is to assess the potential for surface soil impact due to deposition of heavy metals from air emissions generated during operation of the TFM Site. Aerial dispersion soil sampling areas will be performed based on results of air dispersion modeling results. The air dispersion modeling will be completed prior to the start of sampling activities. It is anticipated that locations will generally be north and south of the TFM Site, based upon prevailing wind patterns for the vicinity of the TFM Site. The specific properties to be sampled for aerial dispersion will depend upon obtaining access agreements.

Approximately 10 air dispersion soil samples will be collected. When possible, the sample locations will be positioned in areas likely to be undisturbed (old [pre-1920] residential properties, pasture areas, etc.). At each property to be sampled, a five-point composite soil sample will be collected from an area required to be representative based on the topography; the maximum sampling area is 2,500 square feet. Locations adjacent to roadways or within drip-lines of structures will be avoided.

Each sample aliquot collection point will be prepared by clearing vegetation, rocks, debris, and other materials from an approximately 6-inch by 6-inch area, prior to the composite sample collection. Because the desired sampling interval is shallow (0 to 3 inches bgs), soil held by the roots of the vegetation will be separated from the vegetation and will be retained for inclusion with the sample to be collected. If the collection point is within a lawn area, the grass removed from the sample collection point will be replaced after sample collection. Each aliquot will then be collected from a depth of 0 to 3 inches bgs using a stainless steel trowel, spoon, or hand auger. All aliquots will be

placed into the same re-sealable plastic bag (i.e. 1-gallon Ziplock<sup>®</sup> bag), which will then be kneaded to homogenize the soil. The bag will then be opened and the mixed soil transferred into the appropriate laboratory-supplied sample containers. The soil samples will not be sieved in the field prior to placement into the containers. The samples will be sieved in the laboratory prior to analysis. The filled sample containers will be properly labeled and placed into an ice-cooled chest, pending shipment to the analytical laboratory.

After completion of each soil sample collection, the excavation will be filled to the extent possible using excess soil removed from the excavation to reduce potential IDW. If additional soil is needed to fill the excavation to ground level, commercially purchased topsoil will be utilized. The topsoil will be compacted as necessary to prevent settling. In lawn areas, the grass removed during location preparation will be replaced and tamped into place. Any excess soil sample material generated as part of the sampling activities will be containerized and stored at the TFM Site, pending waste characterization and disposal.

## 4.3 Residential Soil Sampling

The intent of the residential soil sampling activities is to assess the potential for TFM Site waste materials to have been physically transported offsite for use as fill material in offsite locations. Residential soil sampling will be performed at properties located in areas generally within 1.5 miles of the TFM Site, although locations at a greater distance from the Site may be sampled depending upon field observations or property owner knowledge of past use of TFM Site waste materials on a property. At sites on which smelter wastes are specifically identified, presence of the wastes will be documented through recording observations in the field log books and obtaining a photographic record. The specific number and locations of properties to be included in the residential soil sampling will depend upon obtaining access agreements.

Approximately 1,200 samples from approximately 300 to 400 properties will be included in the residential soil sampling activities. It is anticipated that 2 to 4 areas will be sampled at each property: the front yard, the back yard, side yards, and the gravel driveway (if applicable). At large properties (greater than approximately 10,000 square feet [0.25 acre]) additional samples may be collected from areas to be determined based on the Site layout. When possible, locations adjacent to roadways or within drip-lines of structures will be avoided.

Two soil samples will be collected for each area sampled at a given property. One sample will be collected from the 0- to 6-inch depth interval and the second sample will be collected from the 6- to

12-inch interval. Deeper samples (12 to 18 inches) will be collected only if the property owner indicates that TFM waste materials were used as fill in the sampled area or if field observations indicate that waste materials may be present at depths greater than 12 inches. The composite samples will be collected from an area comprising approximately 2,500 square feet. In general, the sampling areas will measure approximately 50 feet X 50 feet; however, the dimensions may need to be adjusted to match the layout of the residential property.

Each soil sample will be prepared as a 5-point composite. Each sample aliquot collection point will be prepared by clearing vegetation, rocks, debris, and other materials from an approximately 6-inch by 6-inch area. Separation of soil from vegetation roots is not necessary. If the sample aliquot collection point is within a lawn area, the grass removed from the collection point will be retained and replaced after sample collection.

Sample aliquots will be collected from each collection point at depths of 0- to 6-inches and 6- to 12-inches bgs using a stainless steel hand auger. Soil aliquots from the same depth interval for the area being sampled will be placed into the same re-sealable plastic bag. The bag will then be kneaded to homogenize the soils. The bag will then be opened and the soil transferred into the appropriate laboratory-supplied sample containers. The soil samples will not be sieved in the field prior to placement in the containers. The samples will be sieved in the laboratory prior to analysis. The filled sample containers will be properly labeled and placed into an ice-cooled chest, pending shipment to the analytical laboratory.

After completion of each soil sample collection, the excavation will be filled to the extent possible using excess soil removed from the excavation to reduce potential IDW. If additional soil is needed to fill the excavation to ground level, commercially purchased topsoil will be utilized. The topsoil will be compacted as necessary to prevent settling. In lawn areas, the grass removed during location preparation will be replaced and tamped into place. Any excess soil sample material generated as part of the sampling activities will be containerized and stored at the TFM Site, pending waste characterization and disposal.

## 4.4 Sample Location Survey

Upon completion of sample collection at each property, the location of the residential and air dispersion sample points will be determined using field portable global positioning system (GPS) equipment. The measurement will be performed in the center of the area sampled (i.e. the center point



of the five-point composite). The GPS equipment will be capable of measuring the horizontal position of the sample location within approximately 2 meters.

## 4.5 Sample Analysis

The air dispersion soil samples and residential soil samples will be submitted to an offsite, fixed-base laboratory for analysis. The laboratory will be part of the EPA Contract Laboratory Program (CLP). CLP protocols will be utilized for shipment and documentation of the samples, including the use of the Forms II Lite software to create the sample labels and tracking documentation.

Each sample will be analyzed for arsenic, cadmium, lead, and zinc using CLP ILM05.4 SOW for Inorganic Analysis. Samples will be shipped to the laboratory by overnight courier under chain-of-custody (COC) documentation.

## 4.6 Field Quality Control Sample Collection and Analysis

Quality Assurance/Quality Control (QA/QC) samples to be collected during the sampling event, as well as laboratory QA/QC requirements, are described in Section 2.5.1 of the QAPP. QA/QC samples to be collected in the field include field duplicates, equipment rinsate blanks, and matrix spike/matrix spike duplicates (MS/MSD). Temperature blanks will also be included with cooler shipments. Field duplicate samples will be collected at a rate of 1 duplicate for every 10 field samples. Equipment rinsate blanks will be prepared at a rate of one per every day of sampling. Matrix spike/matrix spike duplicate samples will be prepared at a rate of one for every 20 field samples.

## 5.0 Decontamination and Waste Management Procedures

---

This section describes decontamination and waste management procedures to be followed during sampling activities. To avoid cross-contamination, non-disposable equipment used during the sampling event must be decontaminated following appropriate procedures. Waste generated from the sampling activities will be disposed of in an appropriate manner.

### 5.1 Equipment Decontamination

Field equipment that may be directly or indirectly exposed to samples will be decontaminated prior to each use. In addition, samples will be prevented from coming into contact with potentially cross-contaminating substances. The following procedure will be used to decontaminate non-dedicated reusable devices (such as stainless steel trowels, bowls, spoons, and hand augers):

- Establish a clean base of operation free from potential contamination (may include placing plastic sheeting on the ground)
- Scrub equipment with brushes and an Alconox and potable water wash rinse
- Rinse equipment with a solution of potable water until all visible signs of dirt are removed
- Rinse equipment with American Society for Testing and Materials (ASTM) Type II water
- Air dry equipment and prevent exposure to potentially contaminating substances

Following decontamination the sampling equipment and utensils will be placed into plastic bags or wrapped in aluminum foil to protect the equipment from contamination prior to use. Decontamination fluids will be handled in accordance with [Section 5.2](#).

### 5.2 Management of Investigation-Derived Waste

The IDW generated during the investigation will consist of used consumable goods (such as gloves, plastic bags, and towels), excess soil sample material, and decontamination wastewater. All IDW generated during the investigation will be placed into Department of Transportation- (DOT) approved, steel 55-gallon drums and staged at the TFM Site pending waste characterization and disposal. Different types of waste (i.e. soil, water, used consumable goods) will be segregated into

separate drums. The used consumable goods will be placed into trash bags prior to placement into the drums. Drums containing soil will be filled to only 2/3 of total capacity to avoid excessive weight.

Upon completion of the field activities, waste characterization sampling will be performed. To characterize the waste, one composite sample of the waste soils and one composite sample of the waste decontamination waters will be collected. The samples will be submitted to an analytical laboratory for extraction by the toxicity characteristic leaching procedure (TCLP) SW-846 Method 1311 and then analysis for TCLP metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) by SW-846 Methods 6010B and 7470A

## 6.0 Sample Handling and Custody

---

This section describes procedures for proper sample handling and custody. Proper sample identification, tracking, documentation, and preservation are necessary to provide reliable and defensible data from the investigation. Sample analytical methods are provided in the QAPP in Section 2.4 and in Tables 2-1, 2-2, and 2-3.

Proper sample handling, shipment, and maintenance of a COC are key components of building the documentation and support for data that can be used to make project decisions. It is essential that all sample handling and sample COC requirements be performed in a complete, accurate, and consistent manner. Sample handling and custody requirements must be followed for all samples collected as part of this investigation. The QAPP provides the requirements and/or procedures for field documentation (Section 1.7.1), sample containers, preservatives, and holding times (Section 2.3.1 and Table 2-1), and sample packing, shipping, and custody (Section 2.3.2 and Figure 2-1).

The FTL, or a field team member designated by the FTL and PM, is responsible for proper sampling, labeling of samples, preservation, and shipment of samples to the laboratory to meet required holding times.

### 6.1 Sample Containers and Preservatives

The sample containers, preservative requirements, and maximum holding times for the common methods used to analyze samples are found in the QAPP in Section 2.3.1 and Table 4.

### 6.2 Sample Labeling and Identification

#### 6.2.1 CLP Sample Labeling and Identification

All samples will be assigned a unique sample identification number (SampleID) via the CLP. The SampleIDs required to be used for CLP samples will be provided by the USEPA Region 6 Regional Sample Control Coordinator (RSCC). SampleIDs for samples sent to non-CLP laboratories (such as waste characterization samples) will be assigned by the Project Data Manager (PDM) and identified based on the procedures described below. Samples submitted to a CLP laboratory will also have a SampleID assigned using the procedure described below for purposes of sample tracking within the project database. A sample station identification number (StationID) will uniquely identify each

sample location. The StationID labeling procedures are discussed in more detail in the sections below.

Samples will also be labeled with the date and time the sample was collected, the type of sample collected, the depth and location the sample was collected from, the name of the sampler, and other pertinent information. The entire sample designation will be recorded for each sample in the field logbook and on the Traffic Report (TR)/COC forms as described in [Section 7](#) and in the sections of the QAPP mentioned above. The FORMS II Lite Software Program, Version 5.1 will be used for sample tracking. This sample-tracking program was designed to automate the sample tracking and retrieval process. Specific data management procedures are described in the Data Management Plan (DMP), included in the QAPP.

Samples that are to be submitted to a CLP lab for analysis must adhere to the guidelines set forth in the EPA's *Sampler's Guide to the Contract Laboratory Program*.

## 6.2.2 Non-CLP Sample Labeling and Identification

The PDM will be informed of the schedule for collection of soil samples and will generate labels as appropriate in advance of sample collection. Locations will be associated with each soil sample ID in the field at the time of collection. Samples collected and sent to the EPA Region 6 Laboratory in Houston, Texas, will follow CLP sampling guidelines and use EPA tags, seals, and documentation. Samples submitted to the EPA Region 6 Houston Lab also require the use of Forms II Lite for sample tracking.

## 6.2.3 Split and Independent Sample IDs and Station IDs

SampleIDs for the samples collected for the split and independent sampling programs will have the following format: mmddyyynn. The first six characters (mmddyy) will indicate the month, day, and year that the sample was collected. The final three characters are a sequential number for the samples collected on that day. For example, 121007003 would indicate the third sample collected on December 10, 2007. Field teams conducting the sampling will communicate frequently during the field activities to ensure that field samples are numbered sequentially and that no duplications or exclusions occur.

## 6.2.4 Field Quality Control Samples

Field quality control samples will include field duplicates, equipment rinse blanks, and matrix spike/matrix spike duplicate samples. SampleIDs for the field QA/QC samples will have the

following format: mmdyyynnnqq. The first nine characters are the same as for normal field samples. The final two characters (qq) will indicate the type of field QA/QC sample collected.

FD = Field Duplicate

EB = Equipment Rinsate Blank

Because matrix spike and matrix spike duplicate samples consists of additional sample material for a normal field sample, the matrix spike and matrix spike samples will be identified with the same SampleID as the parent sample. Notation will be made on the COC that additional volume was collected for that sample to allow for MS/MSD analysis.

All field QA/QC samples will be assigned the StationID "FIELDQC".

## 6.3 Sample Handling, Chain of Custody, and Sample Shipping

The requirements for sample handling, required chain of custody procedures, and sample shipping are presented in the QAPP in Section 2.3.2 and Figure 1. Additional information on COC records and packing and shipment documentation are also presented in Section 2.3 of the QAPP.

[This page intentionally left blank.]

# 7.0 Property Control and Field Documentation

---

This section describes the procedures for property control (for consumables and equipment) and field documentation. The purchasing of non-consumables or the use of government-owned equipment is not anticipated for this project; however, the procedures in this section will be followed should purchase of non-consumables be necessary.

## 7.1 Property Control

Property procured in support of the field activities described by this FSP (consumables and equipment) will be managed as appropriate in accordance with the Federal Acquisition Regulation (FAR). CH2M HILL has prepared guidelines for property control on government contracts; these guidelines are presented in [Appendix B](#). The assigned CH2M HILL property control representative (PCR) will use these management guidelines to track the cost, purchase, receipt, and maintenance of all government-owned and leased material acquired during the project. The PCR will provide regular updates to the PM regarding the status of government property and will communicate as needed with CH2M HILL's corporate government property administration. A key assumption related to all field activities is that existing office space, sampling equipment, and other related facilities accountable under Contract No. EP-W-06-021 can be used for this work on a rent-free, non-interference basis.

## 7.2 Log Books and Daily Reports

This section describes the procedures for maintaining field log books, documenting sample collection, and preparing daily reports during the field work described by this FSP.

### 7.2.1 Field Log Books

Bound field log books with sequentially numbered pages will be maintained by the FTL and other team members to provide a daily record of significant events, observations, and measurements made during sampling. All information pertinent to the sampling activities will be recorded in the log books. All entries will be signed and dated and must include at least the following information:

- Name and title of author, date and time of entry and exit, and weather/environmental conditions during the field activity
- Location of sampling activity



- Name and title of field crew members
- Name and title of site visitors
- Sample media
- Sample collection method
- Number and volume of sample(s) taken
- Dates and times of specific activities (such as sample collection, health and safety tailgate meetings, and lunch breaks) performed
- SampleID(s)
- Sample descriptions (such as depth the sample was taken from or the source of the sample) and identification of conditions that might affect the representativeness of a sample (such as broken or damaged equipment)
- Sample distribution (for example, which laboratory the sample was submitted to for analysis)
- Field observations to include observation of smelter wastes on residential or commercial properties (although sampling is not currently planned at commercial properties)
- Field equipment model numbers, serial numbers and calibration results.
- Field measurements, including units (such as air monitoring data)
- Description of photographs taken
- Problems encountered/unusual conditions and means of resolution
- All sample documents such as:
  - Bottle lot numbers
  - Dates and method of sample shipments
  - COC forms
  - Sample handling (preservation) methods

All original data recorded in field log books, sample labels, and COC forms will be written with waterproof, black, indelible ink. None of these accountable documents are to be destroyed or thrown

away, even if an entry or document is illegible or contains inaccuracies requiring document replacement. If an error is made on an accountable document assigned to one individual, that individual should make all corrections simply by crossing a line through the error, initialing and dating the correction, and entering the correct information. The erroneous information should not be obliterated. Any subsequent error discovered on an accountable document should be corrected by the person who made the entry. All subsequent corrections will be initialed and dated. For subsequent information on field sampling documentation, refer to Section 1.7.1 of the QAPP.

## 7.2.2 Field Sampling Forms

The following field sampling forms will be used to keep track of daily field activities and are included in [Appendix A](#):

- Daily Health and Safety Tailgate Meeting Form
- Daily Field Activities Form
- Field Photography Log
- Sample Collection Sheets

## 7.2.3 Daily Reports

Daily reports will be made by the FTL to the PM, or a team member designated by the PM, using the Daily Field Activities Form provided in [Appendix A](#).

## 7.3 Photographs

Photographs will be taken, as needed, to document daily activities and notable events such as health and safety issues, site conditions, and decontamination procedures. Electronic versions of the photographs will be stored on a secure CH2M HILL server with an appropriate directory structure for identifying and documenting photographs. When a photograph is taken, the following information will be written in the log book and/or will be recorded in a separate field photograph log provided in [Appendix A](#):

- Time, date, location, direction facing, and, if appropriate, weather conditions
- Description of the subject photographed
- Name of person taking the photograph

## 7.4 Chain of Custody Records

Chain of Custody Record requirements are detailed in Section 2.3.2 of the QAPP

COCs are used to document sample collection and submittal to a laboratory for analysis. The COC tracks the custody of the sample from the time of collection through transport, sample receipt, preparation, analysis and storage, data generation and reporting, and sample disposal. All sample shipments will be accompanied by a COC record, or Traffic Report (TR), that will be produced by the Forms II Lite sample tracking software

## 7.5 Packaging and Shipment Documentation

Sample packaging and shipping requirements are detailed in Section 2.3.2 of the QAPP. A diagram showing proper labeling of sample coolers is presented in Figure 1 of the QAPP. Shipping documentation (for example airbills or invoices) will be retained in the general project files.

## 8.0 Data Management

---

This section of the FSP presents the DMP for the project. The DMP includes planning, collecting, evaluating, storing, and reporting information gathered during data collection activities.

### 8.1 Sample Management

The PDM will assist the Project Chemist (PC) with tracking the status of samples submitted to the offsite laboratory. This includes providing the PC a report of laboratory performance with respect to sample receipt and turnaround time.

All sampling information will be captured in logbooks and where appropriate, captured electronically and managed in the field through the use of FORMS II Lite Software, Version 5.1. A COC will be generated for each CLP and non-CLP sample collected, as described in Section 2.3.2 of the QAPP. Sample labeling requirements are described in [Section 6.1.2](#). In addition, sample collection information, all in-situ measurements, and observations made during collection of field samples will be documented in the field logbook and on field data forms, as described in [Section 7.2](#).

A copy of the FORMS II Lite database file will be sent to the PDM at the end of each sampling event. In addition, a photocopy or electronic image of each COC will be made and forwarded to the PDM.

#### 8.1.1 CLP Laboratory Data Sample Management

All collection information for samples submitted to a CLP laboratory will be managed in the field using FORMS II Lite Software. All TR/COCs for these samples will be generated by this software package. The field sampling team will fax the "Regional" copy of each TR/COC generated to the Region 6 RSCC and to the PC. An electronic export file of the TR/COC, produced through the FORMS II Lite Software, will be emailed to the CLP Sample Management Office (SMO) at the address provided on the CLP Laboratory Assignment Form the RSCC provides with each CLP case number assignment. In the event that access to email is not available, the TR/COC should be faxed to the SMO. All TRs/COCs will be forwarded to the RSCC, PC, and SMO on the date of sampling. The field sampling team will contact the SMO to notify them that a shipment to the laboratory has been made. The SMO must be contacted by 8:00 AM of the day following a sample shipment. For Saturday delivery, the CLP SMO must be notified by 3:00 p.m. EST on the Friday prior to sample

delivery. There will be no formal acknowledgment by the lab for receipt of the samples. Instead, the laboratory will respond only to the SMO concerning a shipment of samples.

### 8.1.2 Non-CLP Laboratory Data Sample Management

All collection information for samples destined for the EPA Region 6 laboratory will be managed in the field using FORMS II Lite Software. All TR/COCs for these samples will be generated by this software package. The field sampling team will fax the "Regional" and "Laboratory" copies of TR/COCs generated to the EPA Houston Laboratory sample manager prior to shipment. This will serve as notification to the EPA Houston Laboratory of samples being shipped to the laboratory and the requested analysis. A copy of the TR/COCs will also be faxed to the PC at the same time. In addition, the field sampling team will contact the EPA Houston Laboratory SMO to notify that a shipment to the laboratory has been made. The SMO must be contacted by 8:00 AM of the day following a sample shipment. the EPA Houston Laboratory does not accept sample delivery on Saturdays; therefore all samples must be collected in a timely manner to avoid Friday shipments. There will be no formal acknowledgment by the laboratory for receipt of the samples. Instead, the laboratory will respond only to the SMO concerning a shipment of samples.

### 8.1.3 Other Data Management

Sampling related data generated in the field during sampling events will be managed through the use of field logbooks and /or field data sheets. Examples of such data include survey, water level, lithology, and in situ field measurements. A photocopy or electronic image of each field logbook page and each field data sheet completed during sampling will be made and forwarded to the PDM at the end of the sampling event. This information will be used to update the project analytical database.

## 8.2 Sample Data Transfer

Laboratory analytical data will be reported for each CLP and non-CLP sample collected. The analytical data will be reported by the laboratories in both a hardcopy format and an electronic format.

### 8.2.1 CLP Laboratory Data Transfer

The laboratory data deliverables provided under the CLP include the pre-validation hardcopy data package, and an electronic data deliverable (EDD) containing the post validation results in

Microsoft® Excel workbook format. The electronic workbook will be provided via email or through a fixed media like CD-R or a 3.5-inch diskette. The hardcopy data package and the EDD (if applicable) will be shipped by courier service to the PM or designee.

## **8.2.2 Non-CLP Laboratory Data Transfer**

Laboratory analytical data will be reported for each sample collected and submitted to the EPA Houston Laboratory. The analytical data will be reported in hard copy format, as well as electronically. The analytical results will be provided electronically as a Microsoft® Access 97 database or a Microsoft Excel spreadsheet. The EDD and a PDF file of the report will be provided to the EPA TOM and the CH2M HILL Project Chemist via email. The hard copy data package will be shipped by courier service to the EPA TOM.

## **8.2.3 Other Data Transfer**

The photocopies generated by the field sampling team will be shipped by courier service. Electronic images will be sent to the PDM via email. Any COC photocopies being sent to the PDM will be shipped for overnight delivery.

# **8.3 Sample Data Storage**

Hardcopy and EDDs will be received, managed, and stored for this project. The hardcopy data packages will be filed by sample delivery group (SDG) or laboratory batch, as appropriate. Custody of the hardcopy data packages will be tracked through a sign-out log. Photocopies of field logbook pages, field data sheets, and COC forms are filed chronologically in the data management notebook. The project electronic data will be stored and managed in the project analytical database. The data files will be maintained on a local area network (LAN) server. Data access will be password-protected at the network and database level.

## **8.3.1 CLP Laboratory Data Storage**

Analytical EDDs submitted by the CLP Laboratory will be stored on the LAN in the project folder. The EDD file submitted by the CLP laboratory will be used to generate/update a database of analytical results for the project. A series of QC checks are performed against the EDD prior to import of the data into the database, and any issues noted will be addressed and resolved with the assistance of the PC, FTL, or CLP SMO. The EDDs will be verified at 20 percent against the hard

copy data packages to evaluate accuracy of the deliverable. Any discrepancies will be noted and resolved with assistance by the PC, the FTL, or the CLP SMO. The hardcopy data deliverables will be filed as noted above.

### **8.3.2 Non-CLP Data Storage Management**

Analytical EDDs submitted by the Houston EPA Laboratory will be stored on the local area network in the project folder. The EDD file submitted by the EPA Houston Laboratory will be used to update EDMS with the analytical results generated under the CLP. A series of QC checks are performed against the EDD prior to performing the EDMS update, and any issues noted will be addressed and resolved with the assistance of the PC, FTL, or Houston SMO. The EDDs will be verified at 20 percent against the hard copy data packages to ensure accuracy of the deliverable. Any discrepancies will be noted and resolved by the PC, FTL, or Houston SMO. The hardcopy data deliverables will be filed as noted above.

### **8.3.3 Other Data Storage**

Field sampling data, in-situ measurements, and location information will be transcribed directly from the photocopy or electronic image into the project database. A summary report will be generated through the database for verification purposes. Any transcription errors noted will be documented and resolved. The photocopies will be filed in the project data management notebook. The source logbooks or documents will be maintained by the PM or their designee.

## **8.4 Data Evaluation**

The data evaluation phase of the project includes activities to assess the validity and technical significance of the analytical data.

### **8.4.1 Data Validation**

The PC will review output, generated through the project database and the associated supporting hardcopy reports, to assess the quality of the data with respect to the project-specific DQOs. EPA staff will perform the data validation task for those samples analyzed under CLP. The PC will evaluate all data for any QC-related trends. The PC will perform the data validation task for those samples analyzed by the commercial laboratory.

#### **8.4.1.1 EPA Region 6 CLP Data Validation**

Validation of CLP data will be performed by the EPA Region 6 Environmental Services Assistance Team (ESAT). The results of the data validation process will be provided to the PDM in an electronic Microsoft® Excel compliant format. The worksheet file will be used to update the project database with post validation results and qualifiers. A report summarizing the updates will be generated and verified against the hardcopy report. Any errors noted will be documented and resolved with the assistance of the PC.

#### **8.4.1.2 Non-CLP Laboratory Data Validation**

The PC will validate the data received from the EPA Houston Laboratory to assess the quality of the data with respect to the project-specific DQOs. EPA staff will perform an initial review of data generated at the EPA Houston Laboratory prior to data package submission to ensure no data quality issues are present.

The PC or a designee will make photocopies of the field sample results submitted in the hardcopy data package. The validator will use these copies during the validation process. The EPA Houston Laboratory report photocopies will be edited in red pen by the data validation personnel to indicate any required changes to results and qualifiers. The validation modifications will then be used to update the EDMS data set. A report summarizing the results and qualifiers for each sample in each laboratory batch will then be generated. These summary reports will be used to verify that the requested validation modifications were made to the EDMS data set. During this verification process, each result and qualifier will be confirmed against the hardcopy deliverable for both modified and unmodified results.

### **8.4.2 Technical Evaluation**

Once the information is updated and verified in the project database, it will be used to generate data quality summary tables. The PC will review the data quality summary tables to determine if any global modifications are required for the data set. If global data flagging is required, the PC will document those modifications and request that the PDM update the database. Once any required modifications to the database are complete, the validated data will then be available to the members of the project team to support the technical evaluations regarding site conditions. Potential data evaluation activities include statistical reduction, nature and extent evaluation, and trend analysis.



## 8.5 Data Reporting

The PDM will provide support to the project team through generation of data summary tables, criteria comparison tables, analytical data tables, and statistical summary tables.

The finalized project database will be provided to EPA as a project deliverable.

## 9.0 References

---

Burns & McDonnell, 2007. *Remedial Investigation Report for Tulsa Fuel and Manufacturing, Collinsville, Oklahoma.* August 2007.

CH2M HILL, 2007. *Quality Assurance Project Plan for Tulsa Fuels and Manufacturing Supplemental Remedial Investigation/Feasibility Study Tulsa County, Oklahoma.* November 2007.

CH2M HILL, 2007. *Health and Safety Plan for Tulsa Fuels and Manufacturing Supplemental Remedial Investigation/Feasibility Study Tulsa County, Oklahoma.* November 2007.

United States Environmental Protection Agency (USEPA), 2003. *Superfund Lead-Contaminated Residential Sites Handbook.* August 2003.

[This page intentionally left blank.]

Appendix A

# CH2M HILL Field Sampling Forms

---

[This page intentionally left blank.]

<b>Activity:</b>	<b>Date:</b>
	<b>Project:</b>
<b>Description of the work:</b>	<b>Site Supervisor:</b>
	<b>Site Safety Officer:</b>
	<b>Review for latest use: Before the job is performed.</b>

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)

Equipment to be used (List equipment to be used in the work activity)	Inspection Requirements (List inspection requirements for the work activity)	Training Requirements (List training requirements including hazard communication)

	<u><b>PRINT NAME</b></u>	<u><b>SIGNATURE</b></u>	
<b>Supervisor Name:</b>	_____	_____	<b>Date/Time:</b> _____
<b>Safety Officer Name:</b>	_____	_____	<b>Date/Time:</b> _____
<b>Employee Name(s):</b>	_____	_____	<b>Date/Time:</b> _____
	_____	_____	<b>Date/Time:</b> _____
	_____	_____	<b>Date/Time:</b> _____
	_____	_____	<b>Date/Time:</b> _____
	_____	_____	<b>Date/Time:</b> _____
	_____	_____	<b>Date/Time:</b> _____
	_____	_____	<b>Date/Time:</b> _____
	_____	_____	<b>Date/Time:</b> _____
	_____	_____	<b>Date/Time:</b> _____



DCN	CH2M HILL DAILY FIELD ACTIVITIES SUMMARY				Date
PROJECT NAME: <i>Tulsa Fuel and Manufacturing Site, Supplemental RI</i>					
DATE:		Shift Beginning:		Field Event Report No.	
EPA Contract Number: EP-W-06-021			CH2M Hill Job No. 365672		
EPA Task Order Manager: Mike McAteer / USEPA Region 6					
CH2M HILL Project Manager: Tim McDonald / TUL			CH2M HILL Field Team Leader:		
Personnel Onsite:					
CH2MHILL:					
Work Performed:					
PPE Required					
Samples Collected (type, location, ID numbers, etc.)					
Soil:	Sediment:	Surface Water:	Ground Water:	Other:	
Field Analysis (type, results, calibration, problems, etc.)					
Problems and Corrective Actions:					
Quality Assurance/Quality Control Activities Performed:					
Verbal or Written Instructions from EPA TOM or CH2M HILL PM:					
Verbal or Written Comments/Questions from Property Owner or Other Personnel					
Anticipated Activities for the Following Day					

Anticipated Activities for the Following Week:
General Remarks
Report Prepared by (name and date):
Signed:

## CH2M HILL Project No: 365672

Page \_\_\_\_\_ of \_\_\_\_\_

[illegible]

# Field Sampling Data Log Sheet

(Solid Media)

Tulsa Fuel and Manufacturing Site, Supplemental RI

Collinsville, OK

CH2M HILL Project No: 365672

Sampler(s): \_\_\_\_\_  
Location: \_\_\_\_\_ Grid ID: \_\_\_\_\_  
Station ID: \_\_\_\_\_  
GPS Coordinates: Northing - \_\_\_\_\_ Easting - \_\_\_\_\_  
Township/Range/Section: \_\_\_\_\_

## Sample Information

Sample ID: \_\_\_\_\_ Date/Time of Sample Collection: \_\_\_\_\_  
Media Sampled: \_\_\_\_\_  
Equipment Used: \_\_\_\_\_  
Analysis Requested: TAL Metals: \_\_\_\_\_ Geotechnical: \_\_\_\_\_  
Other: \_\_\_\_\_  
QA/QC Samples: Duplicate MS/MSD Rinsate Other: \_\_\_\_\_  
Is This Sample a Split of a PRP Sample: Yes No PRP Sample ID: \_\_\_\_\_  
Sample Depth: \_\_\_\_\_  
Collection Method: Composite Grab  
(If sample is a composite, sketch grid with composite locations under comments below)

## Other Data

Soil pH (for plant samples only): \_\_\_\_\_  
Grain Size (gravel, sand, silt, or clay): \_\_\_\_\_  
Texture : \_\_\_\_\_  
Moisture Content (wet, moist, or dry): \_\_\_\_\_  
Color: \_\_\_\_\_  
Photographs collected ( Yes / No ): \_\_\_\_\_

## Comments:

# Field Sampling Data Log Sheet

(Aqueous Media)

**Tulsa Fuel and Manufacturing Site, Supplemental RI**

**Collinsville, OK**

**CH2M HILL Project No: 365672**

Sampler(s): \_\_\_\_\_  
Location: \_\_\_\_\_ Grid ID: \_\_\_\_\_  
Station ID: \_\_\_\_\_  
GPS Coordinates: Northing - \_\_\_\_\_ Easting - \_\_\_\_\_  
Township/Range/Section: \_\_\_\_\_

## Sample Information

Sample ID: \_\_\_\_\_ Date/Time of Sample Collection: \_\_\_\_\_  
Media Sampled: \_\_\_\_\_  
Equipment Used: \_\_\_\_\_  
Analysis Requested: TAL Metals: \_\_\_\_\_ Geotechnical: \_\_\_\_\_  
Other: \_\_\_\_\_

QA/QC Samples: Duplicate MS/MSD Rinsate Other: \_\_\_\_\_

Is This Sample a Split of a PRP Sample: Yes No PRP Sample ID: \_\_\_\_\_

Sample Depth: \_\_\_\_\_

Collection Method: Composite Grab

(If sample is a composite, sketch grid with composite locations under comments below)

## Other Data

Date/Time	pH	Conductivity (mS/cm)	DO (mg/L)	Turbidity NTU	Temperature °C

Photographs collected ( Yes / No ): \_\_\_\_\_

## Comments:

# CH2M HILL HEALTH AND SAFETY PLAN

This Health and Safety Plan (HSP) will be kept on the site during field activities and will be reviewed as necessary. The plan will be amended or revised as project activities or conditions change or when supplemental information becomes available. The plan adopts, by reference, the Standards of Practice (SOPs) in the CH2M HILL *Corporate Health and Safety Program, Program and Training Manual*, as appropriate. In addition, this plan adopts procedures in the project Work Plan. The Site Safety Coordinator (SSC) is to be familiar with these SOPs and the contents of this plan. CH2M HILL's personnel and subcontractors must sign Attachment 1.

## Project Information and Description

**PROJECT NO:** 365672

**CLIENT:** US EPA

**PROJECT/SITE NAME:** Supplemental Remedial Investigation, Tulsa Fuel and Manufacturing

**SITE ADDRESS:** West side of old US Hwy 169, approx. 1.3 miles south of downtown Collinsville, Oklahoma

**CH2M HILL PROJECT MANAGER:** McDonald, Tim

**CH2M HILL OFFICE:** Tulsa

**DATE HEALTH AND SAFETY PLAN PREPARED:** 11/1/2007

**DATE(S) OF SITE WORK:** November 2007 through January 2008

**SITE ACCESS:** Site is fenced and gated. Site is currently inactive.

**SITE SIZE:** The site proper is approx. 50 acres. Off site investigations will be performed generally within approx 1.5-mile radius from the site.

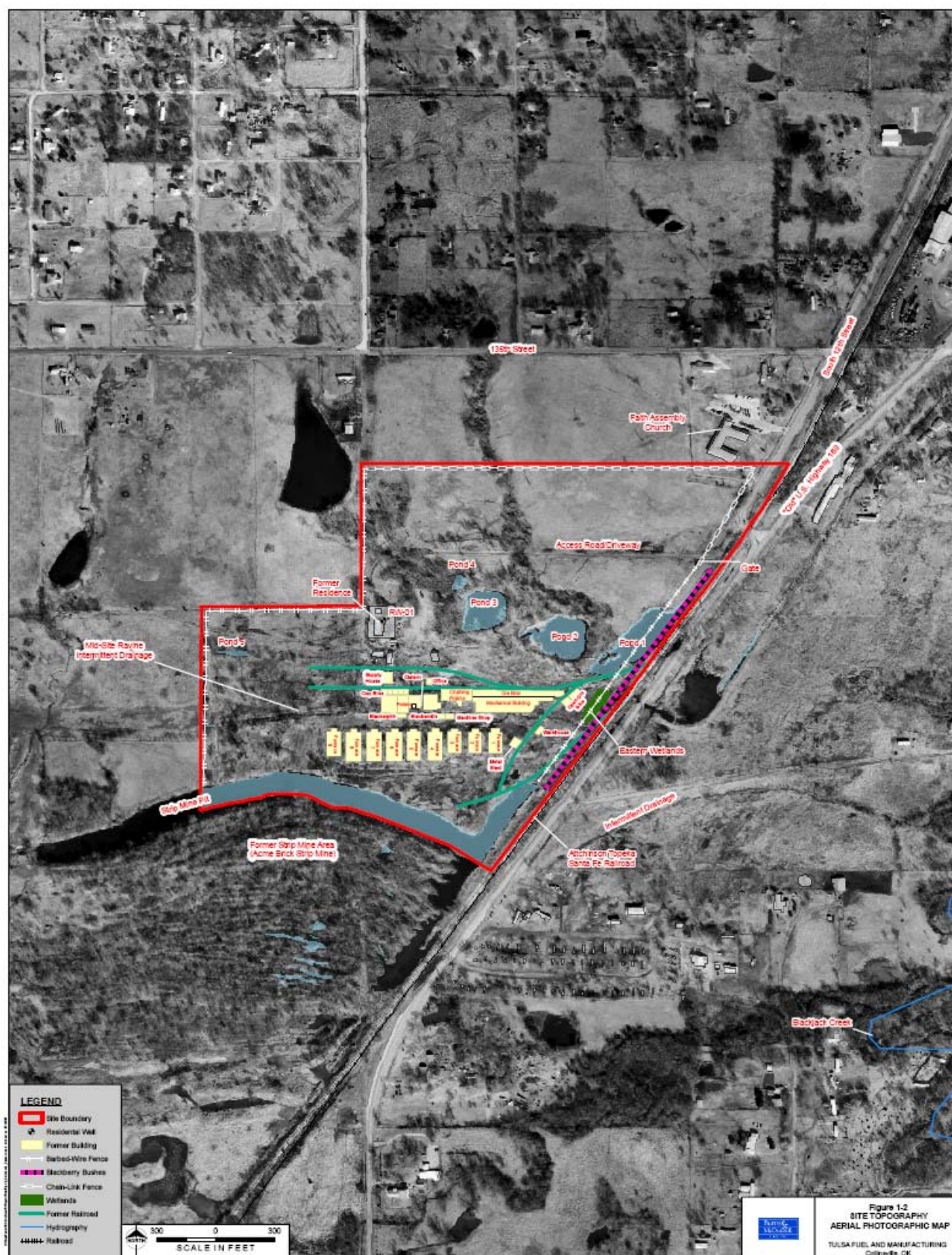
**SITE TOPOGRAPHY:** Gently rolling hills and shallow valleys.

**PREVAILING WEATHER:** Temperate, although below freezing temperatures can be expected during the duration of the work.

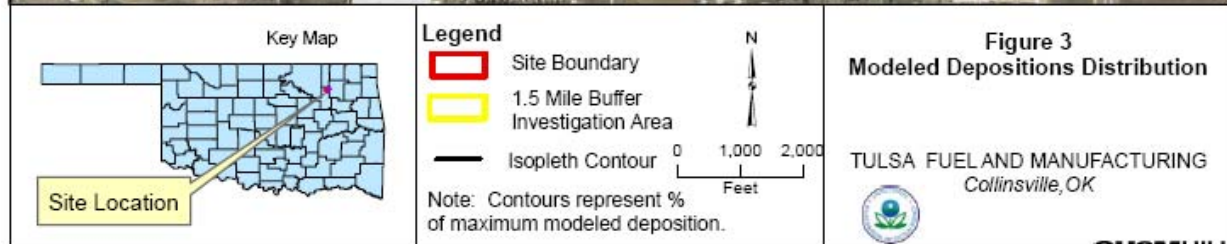
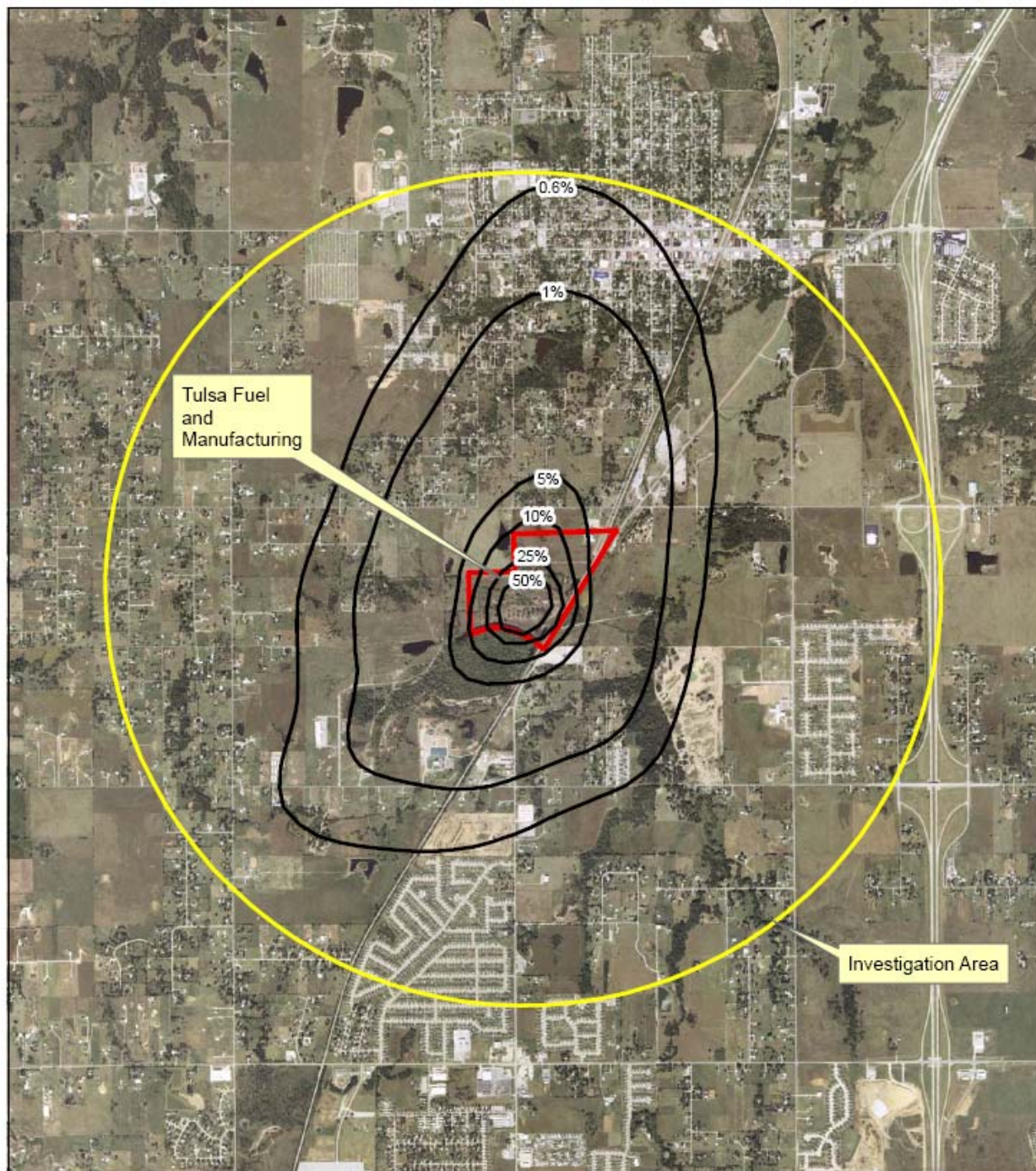
**SITE DESCRIPTION AND HISTORY:** The TFM site was active as a zinc smelter and lead roasting facility from 1914 through 1925. Nine smelting furnaces operated at the facility. A residence was present on-site, occupied from 1935 through 2002. The TFM site was the subject of previous investigations between 1992 and 2005. These investigations indicated the presence of waste materials and elevated metals concentrations (arsenic, cadmium, lead, and zinc) at the site.

**DESCRIPTION OF SPECIFIC TASKS TO BE PERFORMED:** CH2M HILL personnel will use hand augers to collect composite soil samples from off-site private residential and rural properties. The soil samples will be submitted for laboratory analysis of As, Cd, Pb, and Zn. The depth of investigation generally will not exceed 1 foot. CH2M HILL personnel will also be responsible for canvassing properties in the site vicinity to obtain access agreements to properties for the purpose of sample collection.

## Site Map







\\chuckwagon\GIS\NWFILES\TULSA\_FUEL\Collinsville\_OK\MXD\Figure3.mxd. User: rnhattac Dated: 11/06/07





# Table of Contents

<b>PROJECT INFORMATION AND DESCRIPTION .....</b>	<b>I</b>
<b>SITE MAP.....</b>	<b>II</b>
<b>1 TASKS TO BE PERFORMED UNDER THIS PLAN.....</b>	<b>1</b>
1.1 DESCRIPTION OF TASKS .....	1
1.1.1 Hazwoper-Regulated Tasks .....	1
1.1.2 Non-Hazwoper-Regulated Tasks .....	1
1.2 TASK HAZARD ANALYSIS .....	2
<b>2 HAZARD CONTROLS .....</b>	<b>3</b>
2.1 PROJECT-SPECIFIC HAZARDS .....	3
2.2 GENERAL HAZARDS .....	4
2.2.1 General Practices and Housekeeping .....	4
2.2.2 Hazard Communication.....	5
2.2.3 Shipping and Transportation of Chemical Products .....	5
2.2.4 Lifting .....	5
2.2.5 Fire Prevention.....	5
2.2.6 Electrical .....	6
2.2.7 Stairways and Ladders .....	6
2.2.8 Heat Stress.....	7
2.2.9 Cold Stress.....	8
2.2.10 Compressed Gas Cylinders .....	8
2.2.11 Procedures for Locating Buried Utilities .....	8
2.2.12 Confined Space Entry.....	9
2.3 BIOLOGICAL HAZARDS AND CONTROLS .....	9
2.3.1 Snakes.....	9
2.3.2 Poison Ivy and Poison Sumac .....	9
2.3.3 Ticks.....	9
2.3.4 Bees and Other Stinging Insects.....	9
2.3.5 Bloodborne Pathogens .....	10
2.4 RADIOLOGICAL HAZARDS AND CONTROLS .....	10
2.5 CONTAMINANTS OF CONCERN.....	11
2.6 POTENTIAL ROUTES OF EXPOSURE.....	11
<b>3 PROJECT ORGANIZATION AND PERSONNEL .....</b>	<b>12</b>
3.1 CH2M HILL EMPLOYEE MEDICAL SURVEILLANCE AND TRAINING .....	12
3.2 FIELD TEAM CHAIN OF COMMAND AND COMMUNICATION PROCEDURES .....	12
3.2.1 Client .....	12
3.2.2 CH2M HILL .....	12
3.2.3 CH2M HILL Subcontractors .....	12
3.2.4 Contractors.....	13
<b>4 PERSONAL PROTECTIVE EQUIPMENT (PPE) .....</b>	<b>15</b>
<b>5 AIR MONITORING/SAMPLING.....</b>	<b>16</b>
5.1 AIR MONITORING SPECIFICATIONS .....	16
5.2 CALIBRATION SPECIFICATIONS .....	17
5.3 AIR SAMPLING .....	17
<b>6 DECONTAMINATION.....</b>	<b>18</b>
6.1 DECONTAMINATION SPECIFICATIONS.....	18
6.2 DIAGRAM OF PERSONNEL-DECONTAMINATION LINE .....	18
<b>7 SPILL-CONTAINMENT PROCEDURES .....</b>	<b>18</b>
<b>8 SITE-CONTROL PLAN.....</b>	<b>20</b>

8.1	SITE-CONTROL PROCEDURES .....	20
8.2	HAZWOPER COMPLIANCE PLAN .....	20
<b>9</b>	<b>EMERGENCY RESPONSE PLAN .....</b>	<b>21</b>
9.1	PRE-EMERGENCY PLANNING.....	21
9.2	EMERGENCY EQUIPMENT AND SUPPLIES .....	21
9.3	INCIDENT RESPONSE .....	21
9.4	EMERGENCY MEDICAL TREATMENT .....	21
9.5	EVACUATION .....	22
9.6	EVACUATION SIGNALS .....	22
9.7	INCIDENT NOTIFICATION AND REPORTING .....	22
<b>10</b>	<b>APPROVAL .....</b>	<b>23</b>
10.1	ORIGINAL PLAN .....	23
10.2	REVISIONS .....	23
<b>11</b>	<b>ATTACHMENTS .....</b>	<b>23</b>
ATTACHMENT 1:	EMPLOYEE SIGNOFF FORM – FIELD SAFETY INSTRUCTIONS.....	23
ATTACHMENT 2:	PROJECT-SPECIFIC CHEMICAL PRODUCT HAZARD COMMUNICATION FORM .....	23
ATTACHMENT 3:	CHEMICAL-SPECIFIC TRAINING FORM.....	23
ATTACHMENT 4:	EMERGENCY CONTACTS.....	23
ATTACHMENT 5:	PROJECT H&S FORMS/PERMITS .....	23
ATTACHMENT 6:	PROJECT ACTIVITY SELF-ASSESSMENT CHECKLISTS .....	23
ATTACHMENT 7:	APPLICABLE MATERIAL SAFETY DATA SHEETS .....	23

# 1 Tasks to be Performed Under this Plan

## 1.1 Description of Tasks

(Reference Field Project Start-up Form)

Refer to project documents (i.e., Work Plan) for detailed task information. A health and safety risk analysis (Section 1.2) has been performed for each task and is incorporated in this plan through task-specific hazard controls and requirements for monitoring and protection. Tasks other than those listed below require an approved amendment or revision to this plan before tasks begin. Refer to Section 8.2 for procedures related to “clean” tasks that do not involve hazardous waste operations and emergency response (Hawwoper).

### 1.1.1 Hawwoper-Regulated Tasks

- Surface soil sampling
- Hand auguring

### 1.1.2 Non-Hawwoper-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state Hawwoper regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-Hawwoper-trained personnel. **Prior approval from the Health and Safety Manager (HSM) is required before these tasks are conducted on regulated hazardous waste sites.**

## 1.2 Task Hazard Analysis

(Refer to Section 2 for hazard controls)

POTENTIAL HAZARDS	TASKS									
					Soil Sampling	Hand augering				Remediation & construction oversight
Flying debris/objects					X	X				X
Noise > 85dBA										X
Electrical										X
Suspended loads										X
Buried utilities, drums, tanks					X	X				X
Slip, trip, fall					X	X				X
Back injury					X	X				X
Confined space entry										X
Trenches / excavations										X
Visible lightning					X	X				X
Vehicle traffic										X
Elevated work areas/falls										X
Fires										X
Entanglement					X	X				
Drilling										
Heavy equipment										X
Working near water										
Working from boat										
IDW Drum Sampling										

## 2 Hazard Controls

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. These practices and controls are to be implemented by the party in control of either the site or the particular hazard. CH2M HILL employees and subcontractors must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. CH2M HILL employees and subcontractors who do not understand any of these provisions should contact the SSC for clarification.

In addition to the controls specified in this section, Project-Activity Self-Assessment Checklists are contained in Attachment 6. These checklists are to be used to assess the adequacy of CH2M HILL and subcontractor site-specific safety requirements. The objective of the self-assessment process is to identify gaps in project safety performance, and prompt for corrective actions in addressing these gaps. Self-assessment checklists should be completed early in the project, when tasks or conditions change, or when otherwise specified by the HSM. The self-assessment checklists, including documented corrective actions, should be made part of the permanent project records, and be promptly submitted to the HSM.

Project-specific frequency for completing self-assessments: **Weekly or at the beginning of each new phase of work.**

### 2.1 Project-Specific Hazards

#### 2.1.1 Arsenic

- Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met.
- Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.
- Avoid skin and eye contact with liquid and particulate arsenic or arsenic trichloride.
- Arsenic is considered a “Confirmed Human Carcinogen.”
- Arsenic particulates (inorganic metal dust) are odorless. Vapor and gaseous odor varies depending upon specific organic arsenic compound.
- Respiratory protection and other exposure controls selection shall be based on the most recent exposure monitoring results obtained from the competent person.

#### 2.1.2 Cadmium

- Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met.
- Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.
- Cadmium is considered a “Suspected Human Carcinogen.”
- Cadmium particulates (fumes and dust) are odorless.
- Respiratory protection and other exposure controls selection shall be based on the most recent exposure monitoring results obtained from the competent person.

#### 2.1.3 Cold Stress

(Reference CH2M HILL SOP HS-09, *Heat and Cold Stress*)

- Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.
- Consider monitoring the work conditions and adjusting the work schedule using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council (NSC).
- Wind-Chill Index is used to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index does not take into account the body part that is exposed, the level of activity, or the amount or type of clothing worn. For those reasons, it should only be used as a guideline to warn workers when they are in a situation that can cause cold-related illnesses.

- NSC Guidelines for Work and Warm-Up Schedules can be used with the wind-chill index to estimate work and warm-up schedules for fieldwork. The guidelines are not absolute; workers should be monitored for symptoms of cold-related illnesses. If symptoms are not observed, the work duration can be increased.
- Persons who experience initial signs of immersion foot, frostbite, hypothermia should consult the SSC/DSC to avoid progression of cold-related illness.
- Observe one another for initial signs of cold-related disorders.
- Obtain and review weather forecast – be aware of predicted weather systems along with sudden drops in temperature, increase in winds, and precipitation.

#### **2.1.4 Lead**

The following requirements pertain to lead abatement activities:

- Work activities involving cutting, grinding, burning, welding, and other abrasive operations performed on any painted and/or coated surfaces should be treated as having an increased potential for lead exposure.
- Surfaces suspected of containing lead shall be treated as lead unless documentation and/or testing results indicate otherwise.
- Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met.
- Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.
- Do not launder work clothes with ordinary clothes.
- Respiratory protection and other exposure controls selection shall be based on the most recent exposure monitoring results obtained from the competent person.

The following requirements pertain to lead contaminated soils:

- Work shall progress in a sequence from less contaminated to more contaminated areas.
- Water should be added to soils prior to and during excavation, air rotary drilling, and other activities that create or have the potential to create airborne lead contaminated dust. For air rotary drilling operations, water can be added to the boring to reduce dust generation from the cyclone. Depending upon soil type, watering of soil may be required several days prior to commencing ground intrusive activities.
- Personnel working in the vicinity of lead contaminated soil shall wear disposable coveralls or equal and exercise enhanced personal hygiene (i.e., frequent hand washing prior to eating, drinking, and smoking; separation of work and street clothing/footwear; etc.).

#### **2.1.5 IDW Management**

Personnel are permitted to handle and/or sample drums containing investigation-derived waste (IDW) only; handling or sampling other drums requires a plan revision or amendment approved by the CH2M HILL HSM. The following control measures will be taken when sampling drums containing IDW:

- Minimize transportation of drums.
- Sample only labeled drums or drums known to contain IDW.
- Use caution when sampling bulging or swollen drums. Relieve pressure slowly.
- If drums contain, or potentially contain, flammable materials, use non-sparking tools to open.
- Picks, chisels, and firearms may not be used to open drums.
- Reseal bung holes or plugs whenever possible.
- Avoid mixing incompatible drum contents.
- Sample drums without leaning over the drum opening.
- Transfer the content of drums using a method that minimizes contact with material.
- PPE and air monitoring requirements specified in Sections 4 and 5 must address IDW drum sampling.
- Spill-containment procedures specified in Section 7 must be appropriate for the material to be handled.

## **2.2 General Hazards**

### **2.2.1 General Practices and Housekeeping**

(Reference CH2M HILL SOP HS-20, *General Practices*)

- Site work should be performed during daylight hours whenever possible. Work conducted during hours of darkness require enough illumination intensity to read a newspaper without difficulty.
- Good housekeeping must be maintained at all times in all project work areas.
- Common paths of travel should be established and kept free from the accumulation of materials.
- Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.
- Provide slip-resistant surfaces, ropes, and/or other devices to be used.
- Specific areas should be designated for the proper storage of materials.
- Tools, equipment, materials, and supplies shall be stored in an orderly manner.
- As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.
- Containers should be provided for collecting trash and other debris and shall be removed at regular intervals.
- All spills shall be quickly cleaned up. Oil and grease shall be cleaned from walking and working surfaces.

### **2.2.2 Hazard Communication**

(Reference CH2M HILL SOP HS-05, *Hazard Communication*)

The SSC is to perform the following:

- Complete an inventory of chemicals brought on site by CH2M HILL using Attachment 2.
- Confirm that an inventory of chemicals brought on site by CH2M HILL subcontractors is available.
- Request or confirm locations of Material Safety Data Sheets (MSDSs) from the client, contractors, and subcontractors for chemicals to which CH2M HILL employees potentially are exposed.
- Before or as the chemicals arrive on site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly.
- Give employees required chemical-specific HAZCOM training using Attachment 3.
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

### **2.2.3 Shipping and Transportation of Chemical Products**

(Reference CH2M HILL's *Procedures for Shipping and Transporting Dangerous Goods*)

Chemicals brought to the site might be defined as hazardous materials by the U.S. Department of Transportation (DOT). All staff who ship the materials or transport them by road must receive CH2M HILL training in shipping dangerous goods. All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the HSM or the Equipment Coordinator for additional information.

### **2.2.4 Lifting**

(Reference CH2M HILL SOP HS-29, *Lifting*)

- Proper lifting techniques must be used when lifting any object.
  - Plan storage and staging to minimize lifting or carrying distances.
  - Split heavy loads into smaller loads.
  - Use mechanical lifting aids whenever possible.
  - Have someone assist with the lift -- especially for heavy or awkward loads.
  - Make sure the path of travel is clear prior to the lift.

### **2.2.5 Fire Prevention**

(Reference CH2M HILL SOP HS-22, *Fire Prevention*)

- Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet. Extinguishers must:
  - be maintained in a fully charged and operable condition,
  - be visually inspected each month, and
  - undergo a maintenance check each year.
- The area in front of extinguishers must be kept clear.



- Post “Exit” signs over exiting doors, and post “Fire Extinguisher” signs over extinguisher locations.
- Combustible materials stored outside should be at least 10 feet from any building.
- Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site.
- Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.

## **2.2.6 Electrical**

(Reference CH2M HILL SOP HS-23, *Electrical*)

- Only qualified personnel are permitted to work on unprotected energized electrical systems.
- Only authorized personnel are permitted to enter high-voltage areas.
- Do not tamper with electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until lockout/tagout procedures are implemented.
- Inspect electrical equipment, power tools, and extension cords for damage prior to use. Do not use defective electrical equipment, remove from service.
- All temporary wiring, including extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.
- Extension cords must be:
  - equipped with third-wire grounding.
  - covered, elevated, or protected from damage when passing through work areas.
  - protected from pinching if routed through doorways.
  - not fastened with staples, hung from nails, or suspended with wire.
- Electrical power tools and equipment must be effectively grounded or double-insulated UL approved.
- Operate and maintain electric power tools and equipment according to manufacturers' instructions.
- Maintain safe clearance distances between overhead power lines and any electrical conducting material unless the power lines have been de-energized and grounded, or where insulating barriers have been installed to prevent physical contact. Maintain at least 10 feet from overhead power lines for voltages of 50 kV or less, and 10 feet plus ½ inch for every 1 kV over 50 kV.
- Temporary lights shall not be suspended by their electric cord unless designed for suspension. Lights shall be protected from accidental contact or breakage.
- Protect all electrical equipment, tools, switches, and outlets from environmental elements.

## **2.2.7 Stairways and Ladders**

(Reference CH2M HILL SOP HS-25, *Stairways and Ladders*)

- Stairway or ladder is generally required when a break in elevation of 19 inches or greater exists.
- Personnel should avoid using both hands to carry objects while on stairways; if unavoidable, use extra precautions.
- Personnel must not use pan and skeleton metal stairs until permanent or temporary treads and landings are provided the full width and depth of each step and landing.
- Ladders must be inspected by a competent person for visible defects prior to each day's use. Defective ladders must be tagged and removed from service.
- Ladders must be used only for the purpose for which they were designed and shall not be loaded beyond their rated capacity.
- Only one person at a time shall climb on or work from an individual ladder.
- User must face the ladder when climbing; keep belt buckle between side rails
- Ladders shall not be moved, shifted, or extended while in use.
- User must use both hands to climb; use rope to raise and lower equipment and materials
- Straight and extension ladders must be tied off to prevent displacement
- Ladders that may be displaced by work activities or traffic must be secured or barricaded
- Portable ladders must extend at least 3 feet above landing surface
- Straight and extension ladders must be positioned at such an angle that the ladder base to the wall is one-fourth of the working length of the ladder

- Stepladders are to be used in the fully opened and locked position
- Users are not to stand on the top two steps of a stepladder; nor are users to sit on top or straddle a stepladder
- Fixed ladders  $\geq$  24 feet in height must be provided with fall protection devices.
- Fall protection should be considered when working from extension, straight, or fixed ladders greater than six feet from lower levels and both hands are needed to perform the work, or when reaching or working outside of the plane of ladder side rails.

## 2.2.8 Heat Stress

(Reference CH2M HILL SOP HS-09, *Heat and Cold Stress*)

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50°F to 60°F should be available. Under severe conditions, drink 1 to 2 cups every 20 minutes, for a total of 1 to 2 gallons per day. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.
- Acclimate yourself by slowly increasing workloads (e.g., do not begin with extremely demanding activities).
- Use cooling devices, such as cooling vests, to aid natural body ventilation. These devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- Conduct field activities in the early morning or evening and rotate shifts of workers, if possible.
- Avoid direct sun whenever possible, which can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area. Use a wide-brim hat or an umbrella when working under direct sun for extended periods.
- Provide adequate shelter/shade to protect personnel against radiant heat (sun, flames, hot metal).
- Maintain good hygiene standards by frequently changing clothing and showering.
- Observe one another for signs of heat stress. Persons who experience signs of heat syncope, heat rash, or heat cramps should consult the SSC/DSC to avoid progression of heat-related illness.

SYMPTOMS AND TREATMENT OF HEAT STRESS					
	Heat Syncope	Heat Rash	Heat Cramps	Heat Exhaustion	Heat Stroke
Signs and Symptoms	Sluggishness or fainting while standing erect or immobile in heat.	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.
Treatment	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.	Remove to cooler area. Rest lying down. Increase fluid intake.	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.	Cool rapidly by soaking in cool—but not cold—water. Call ambulance, and get medical attention immediately!

### Monitoring Heat Stress

These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is high (>50 percent), or when workers exhibit symptoms of heat stress.

The heart rate (HR) should be measured by the radial pulse for 30 seconds, as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 100 beats/minute, or 20 beats/minute above resting pulse. If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the pulse rate still exceeds 100 beats/minute at the beginning of the next rest period, the

work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 100 beats/minute, or 20 beats/minute above resting pulse.

## 2.2.9 Cold Stress

(Reference CH2M HILL SOP HS-09, *Heat and Cold Stress*)

- Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.
- Consider monitoring the work conditions and adjusting the work schedule using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council (NSC).
- Wind-Chill Index is used to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index does not take into account the body part that is exposed, the level of activity, or the amount or type of clothing worn. For those reasons, it should only be used as a guideline to warn workers when they are in a situation that can cause cold-related illnesses.
- NSC Guidelines for Work and Warm-Up Schedules can be used with the wind-chill index to estimate work and warm-up schedules for fieldwork. The guidelines are not absolute; workers should be monitored for symptoms of cold-related illnesses. If symptoms are not observed, the work duration can be increased.
- Persons who experience initial signs of immersion foot, frostbite, hypothermia should consult the SSC/DSC to avoid progression of cold-related illness.
- Observe one another for initial signs of cold-related disorders.
- Obtain and review weather forecast – be aware of predicted weather systems along with sudden drops in temperature, increase in winds, and precipitation.

SYMPTOMS AND TREATMENT OF COLD STRESS			
	Immersion (Trench) Foot	Frostbite	Hypothermia
Signs and Symptoms	Feet discolored and painful; infection and swelling present.	Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.	Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.
Treatment	Seek medical treatment immediately.	Remove victim to a warm place. Re-warm area quickly in warm—but <b>not</b> hot—water. Have victim drink warm fluids, but <b>not</b> coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.	Remove victim to a warm place. Have victim drink warm fluids, but <b>not</b> coffee or alcohol. Get medical attention.

## 2.2.10 Compressed Gas Cylinders

- Valve caps must be in place when cylinders are transported, moved, or stored.
- Cylinder valves must be closed when cylinders are not being used and when cylinders are being moved.
- Cylinders must be secured in an upright position at all times.
- Cylinders must be shielded from welding and cutting operations and positioned to avoid being struck or knocked over; contacting electrical circuits; or exposed to extreme heat sources.
- Cylinders must be secured on a cradle, basket, or pallet when hoisted; they may not be hoisted by choker slings.

## 2.2.11 Procedures for Locating Buried Utilities

### Local Utility Mark-Out Service

Name: N/A

Phone: 1-800-522-6543

- Where available, obtain utility diagrams for the facility.
- Review locations of sanitary and storm sewers, electrical conduits, water supply lines, natural gas lines, and fuel tanks and lines.
- Review proposed locations of intrusive work with facility personnel knowledgeable of locations of utilities. Check locations against information from utility mark-out service.

- Where necessary (e.g., uncertainty about utility locations), excavation or drilling of the upper depth interval should be performed manually
- Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change in advancement of auger or split spoon).
- When the client or other onsite party is responsible for determining the presence and locations of buried utilities, the SSC should confirm that arrangement.

### **2.2.12 Confined Space Entry**

(Reference CH2M HILL SOP HS-17, *Confined Space Entry*)

No confined space entry will be permitted. Confined space entry requires additional health and safety procedures, training, and a permit. If conditions change such that confined-space entry is necessary, contact the HSM to develop the required entry permit.

When planned activities will not include confined-space entry, permit-required confined spaces accessible to CH2M HILL personnel are to be identified before the task begins. The SSC is to confirm that permit spaces are properly posted or that employees are informed of their locations and hazards.

## **2.3 Biological Hazards and Controls**

### **2.3.1 Snakes**

Snakes typically are found in underbrush and tall grassy areas. If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately. **DO NOT** apply ice, cut the wound, or apply a tourniquet. Try to identify the type of snake: note color, size, patterns, and markings.

### **2.3.2 Poison Ivy and Poison Sumac**

Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas. Become familiar with the identity of these plants. Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.

### **2.3.3 Ticks**

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into boots; spray **only outside** of clothing with permethrin or permethrin and spray skin with only DEET; and check yourself frequently for ticks.

If bitten by a tick, grasp it at the point of attachment and carefully remove it. After removing the tick, wash your hands and disinfect and press the bite areas. Save the removed tick. Report the bite to human resources. Look for symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF). Lyme: a rash might appear that looks like a bullseye with a small welt in the center. RMSF: a rash of red spots under the skin 3 to 10 days after the tick bite. In both cases, chills, fever, headache, fatigue, stiff neck, and bone pain may develop. If symptoms appear, seek medical attention.

### **2.3.4 Bees and Other Stinging Insects**

Bee and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform the SSC and/or buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; seek medical attention if a reaction develops.

### 2.3.5 Bloodborne Pathogens

(Reference CH2M HILL SOP HS-36, *Bloodborne Pathogens*)

Exposure to bloodborne pathogens may occur when rendering first aid or CPR, or when coming into contact with landfill waste or waste streams containing potentially infectious material. Exposure controls and personal protective equipment (PPE) are required as specified in CH2M HILL SOP HS-36, *Bloodborne Pathogens*. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.

## 2.4 Radiological Hazards and Controls

Refer to CH2M HILL's *Corporate Health and Safety Program, Program and Training Manual*, and *Corporate Health and Safety Program, Radiation Protection Program Manual*, for standards of practice in contaminated areas.

Hazards	Controls
None Known	None Required

## 2.5 Contaminants of Concern

(Refer to Project Files for more detailed contaminant information)

Contaminant	Location and Maximum <sup>a</sup> Concentration (ppm)	Exposure Limit <sup>b</sup>	IDLH <sup>c</sup>	Symptoms and Effects of Exposure	PIP <sup>d</sup> (eV)
Arsenic	GW: not reported SB: not reported SS: not reported	0.01 mg/m <sup>3</sup>	5 Ca	Ulceration of nasal septum, respiratory irritation, dermatitis, gastrointestinal disturbances, peripheral neuropathy, hyperpigmentation	NA
Cadmium	GW: not reported SB: not reported SS: not reported	0.005 mg/m <sup>3</sup>	9 mg/m <sup>3</sup>	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]	NA
Lead	GW: not reported SB: not reported SS: 15,900 mg/kg	0.05 mg/m <sup>3</sup>	100	Weakness lassitude, facial pallor, pal eye, weight loss, malnutrition, abdominal pain, constipation, anemia, gingival lead line, tremors, paralysis of wrist and ankles, encephalopathy, kidney disease, irritated eyes, hypertension	NA

Footnotes:

<sup>a</sup> Specify sample-designation and media: SB (Soil Boring), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), S (Surface Soil), SL (Sludge), SW (Surface Water).

<sup>b</sup> Appropriate value of PEL, REL, or TLV listed.

<sup>c</sup> IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen.

<sup>d</sup> PIP = photoionization potential; NA = Not applicable; UK = Unknown.

## 2.6 Potential Routes of Exposure

<b>Dermal:</b> Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Section 4.	<b>Inhalation:</b> Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in Sections 4 and 5, respectively.	<b>Other:</b> Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).
---	--	---

## 3 Project Organization and Personnel

### 3.1 CH2M HILL Employee Medical Surveillance and Training

(Reference CH2M HILL SOPs HS-01, *Medical Surveillance*, and HS-02, *Health and Safety Training*)

The employees listed below are enrolled in the CH2M HILL Comprehensive Health and Safety Program and meet state and federal hazardous waste operations requirements for 40-hour initial training, 3-day on-the-job experience, and 8-hour annual refresher training. Employees designated “SSC” have completed a 12-hour site safety coordinator course, and have documented requisite field experience. An SSC with a level designation (D, C, B) equal to or greater than the level of protection being used must be present during all tasks performed in exclusion or decontamination zones. Employees designated “FA-CPR” are currently certified by the American Red Cross, or equivalent, in first aid and CPR. At least one FA-CPR designated employee must be present during all tasks performed in exclusion or decontamination zones. The employees listed below are currently active in a medical surveillance program that meets state and federal regulatory requirements for hazardous waste operations. Certain tasks (e.g., confined-space entry) and contaminants (e.g., lead) may require additional training and medical monitoring.

Pregnant employees are to be informed of and are to follow the procedures in CH2M HILL’s SOP HS-04, *Reproduction Protection*, including obtaining a physician’s statement of the employee’s ability to perform hazardous activities before being assigned fieldwork.

Employee Name	Office	Responsibility	SSC/FA-CPR
Tim McDonald	TUL	Project Manager	Level C; SSC; FA-CPR
Chuck Dougherty	TUL	FTL	Level C; SSC; FA-CPR
Jayson Burkard	TUL	Alternate FTL	Level C; SSC; FA-CPR
Rebecca Wrobel	DFW	Field Team	Level C; SSC; FA-CPR
Roger Gomez	SAN	Field Team	Level C; SSC; CPR
Zeb Anderson	NOW	Field Team	Level C; FA-CPR
Amber Guilfoyle	SAN	Field Team	Level C; SSC
Aleeca Forsberg	ABQ	Field Team	Level C; CPR

### 3.2 Field Team Chain of Command and Communication Procedures

#### 3.2.1 Client

Contact Name: United States Environmental Protection Agency Region 6

Phone: 214-665-6548

Contact Name: Mike McAteer

Phone: 214-665-7157

#### 3.2.2 CH2M HILL

Project Manager: McDonald, Tim

Health and Safety Manager: Michael Goldman/ATL

Field Team Leader: Jayson Burkard

Site Safety Coordinator: Jayson Burkard

The SSC is responsible for contacting the Field Team Leader and Project Manager. In general, the Project Manager will contact the client. The Health and Safety Manager should be contacted as appropriate.

#### 3.2.3 CH2M HILL Subcontractors

(Reference CH2M HILL SOP HS-55, *Subcontractor, Contractor, and Owner*)

Subcontractor: N/A  
Subcontractor Contact Name: N/A  
Telephone: N/A

The subcontractors listed above are covered by this HSP and must be provided a copy of this plan. However, this plan does not address hazards associated with the tasks and equipment that the subcontractor has expertise in (e.g., drilling, excavation work, electrical). Subcontractors are responsible for the health and safety procedures specific to their work, and are required to submit these procedures to CH2M HILL for review before the start of field work. Subcontractors must comply with the established health and safety plan(s). The CH2M HILL SSC should verify that subcontractor employee training, medical clearance, and fit test records are current and must monitor and enforce compliance with the established plan(s). CH2M HILL's oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

CH2M HILL should continuously endeavor to observe subcontractors' safety performance. This endeavor should be reasonable, and include observing for hazards or unsafe practices that are both readily observable and occur in common work areas. CH2M HILL is not responsible for exhaustive observation for hazards and unsafe practices. In addition to this level of observation, the SSC is responsible for confirming CH2M HILL subcontractor performance against both the subcontractor's safety plan and applicable self-assessment checklists. Self-assessment checklists contained in Attachment 6 are to be used by the SSC to review subcontractor performance.

Health and safety related communications with CH2M HILL subcontractors should be conducted as follows:

- Brief subcontractors on the provisions of this plan, and require them to sign the Employee Signoff Form included in Attachment 1.
- Request subcontractor(s) to brief the project team on the hazards and precautions related to their work.
- When apparent non-compliance/unsafe conditions or practices are observed, notify the subcontractor safety representative and require corrective action – the subcontractor is responsible for determining and implementing necessary controls and corrective actions.
- When repeat non-compliance/unsafe conditions are observed, notify the subcontractor safety representative and stop affected work until adequate corrective measures are implemented.
- When an apparent imminent danger exists, immediately remove all affected CH2M HILL employees and subcontractors, notify subcontractor safety representative, and stop affected work until adequate corrective measures are implemented. Notify the Project Manager and HSM as appropriate.
- Document all oral health and safety related communications in project field logbook, daily reports, or other records.

### **3.2.4 Contractors**

(Reference CH2M HILL SOP HS-55, *Subcontractor, Contractor, and Owner*)

Contractor: N/A  
Contractor Contact Name: N/A  
Telephone: N/A

This plan does not cover contractors that are contracted directly to the client or the owner. CH2M HILL is not responsible for the health and safety or means and methods of the contractor's work, and we must never assume such responsibility through our actions (e.g., advising on H&S issues). In addition to this plan, CH2M HILL staff should review contractor safety plans so that we remain aware of appropriate precautions that apply to us. Except in unusual situations when conducted by the HSM, CH2M HILL must never comment on or approve contractor safety procedures. Self-assessment checklists contained in Attachment 6 are to be used by the SSC to review the contractor's performance ONLY as it pertains to evaluating our exposure and safety.

Health and safety related communications with contractors should be conducted as follows:

- Request the contractor to brief CH2M HILL employees and subcontractors on the precautions related to the contractor's work.
- When an apparent contractor non-compliance/unsafe condition or practice poses a risk to CH2M HILL employees or subcontractors:
  - Notify the contractor safety representative
  - Request that the contractor determine and implement corrective actions
  - If needed, stop affected CH2M HILL work until contractor corrects the condition or practice. Notify the client, Project Manager, and HSM as appropriate.



- If apparent contractor non-compliance/unsafe conditions or practices are observed, inform the contractor safety representative. Our obligation is limited strictly to informing the contractor of our observation – the contractor is solely responsible for determining and implementing necessary controls and corrective actions.
- If an apparent imminent danger is observed, immediately warn the contractor employee(s) in danger and notify the contractor safety representative. Our obligation is limited strictly to immediately warning the affected individual(s) and informing the contractor of our observation – the contractor is solely responsible for determining and implementing necessary controls and corrective actions.
- Document all oral health and safety related communications in project field logbook, daily reports, or other records.

## 4 Personal Protective Equipment (PPE)

(Reference CH2M HILL SOP HS-07, *Personal Protective Equipment*, HS-08, *Respiratory Protection*)

### PPE Specifications <sup>a</sup>

Task	Level	Body	Head	Respirator <sup>b</sup>
General site entry Surveying Observation of material loading for offsite disposal Oversight of remediation and construction	D	Work clothes; steel-toe, leather work boots; work glove.	Hardhat <sup>c</sup> Safety glasses Ear protection <sup>d</sup>	None required
Surface soil sampling Hand augering	Modified D	Work clothes or cotton coveralls <b>Boots:</b> Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers <b>Gloves:</b> Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat <sup>c</sup> Safety glasses Ear protection <sup>d</sup>	None required

### Reasons for Upgrading or Downgrading Level of Protection

Upgrade <sup>f</sup>	Downgrade
<ul style="list-style-type: none"> <li>Request from individual performing tasks.</li> <li>Change in work tasks that will increase contact or potential contact with hazardous materials.</li> <li>Occurrence or likely occurrence of gas or vapor emission.</li> <li>Known or suspected presence of dermal hazards.</li> <li>Instrument action levels (Section 5) exceeded.</li> </ul>	<ul style="list-style-type: none"> <li>New information indicating that situation is less hazardous than originally thought.</li> <li>Change in site conditions that decreases the hazard.</li> <li>Change in work task that will reduce contact with hazardous materials.</li> </ul>

<sup>a</sup> Modifications are as indicated. CH2M HILL will provide PPE only to CH2M HILL employees.

<sup>b</sup> No facial hair that would interfere with respirator fit is permitted.

<sup>c</sup> Hardhat and splash-shield areas are to be determined by the SSC.

<sup>d</sup> Ear protection should be worn when conversations cannot be held at distances of 3 feet or less without shouting.

<sup>e</sup> Cartridge change-out schedule is at least every 8 hours (or one work day), except if relative humidity is > 85%, or if organic vapor measurements are > midpoint of Level C range (refer to Section 5)--then at least every 4 hours. If encountered conditions are different than those anticipated in this HSP, contact the HSM.

<sup>f</sup> Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been approved by the HSM, and an SSC qualified at that level is present.

## 5 Air Monitoring/Sampling

(Reference CH2M HILL SOP HS-06, *Air Monitoring*)

### 5.1 Air Monitoring Specifications

Instrument	Tasks	Action Levels <sup>a</sup>		Frequency <sup>b</sup>	Calibration
Visual Dust monitoring	Soil sampling	No visual airborne dust	Level D	Initially and periodically during tasks	NA
		Visual Airborne dust	Evacuate work area and contact HSM		

<sup>a</sup> Action levels apply to sustained breathing-zone measurements above background.

<sup>b</sup> The exact frequency of monitoring depends on field conditions and is to be determined by the SSC; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate. Monitoring results should be recorded. Documentation should include instrument and calibration information, time, measurement results, personnel monitored, and place/location where measurement is taken (e.g., “Breathing Zone/MW-3”, “at surface/SB-2”, etc.).

<sup>c</sup> If the measured percent of O<sub>2</sub> is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O<sub>2</sub> action levels apply only to ambient working atmospheres, and not to confined-space entry. More-stringent percent LEL and O<sub>2</sub> action levels are required for confined-space entry (refer to Section 2).

<sup>d</sup> Refer to SOP HS-10 for instructions and documentation on radiation monitoring and screening.

<sup>e</sup> Noise monitoring and audiometric testing also required.

## 5.2 Calibration Specifications

(Refer to the respective manufacturer's instructions for proper instrument-maintenance procedures)

Instrument	Gas	Span	Reading	Method
------------	-----	------	---------	--------

## 5.3 Air Sampling

Sampling, in addition to real-time monitoring, may be required by other OSHA regulations where there may be exposure to certain contaminants. Air sampling typically is required when site contaminants include lead, cadmium, arsenic, asbestos, and certain volatile organic compounds. Contact the HSM immediately if these contaminants are encountered.

### Method Description

It is not anticipated that additional sampling will be required. However, this may be done at the discretion of the HSM and SSC

### Personnel and Areas

Results must be sent immediately to the HSM. Regulations may require reporting to monitored personnel. Results reported to:

HSM: Michael Goldman/ATL

## 6 Decontamination

(Reference CH2M HILL SOP HS-13, *Decontamination*)

The SSC must establish and monitor the decontamination procedures and their effectiveness. Decontamination procedures found to be ineffective will be modified by the SSC. The SSC must ensure that procedures are established for disposing of materials generated on the site.

### 6.1 Decontamination Specifications

Personnel	Sample Equipment	Heavy Equipment
<ul style="list-style-type: none"><li>• Boot wash/rinse</li><li>• Glove wash/rinse</li><li>• Outer-glove removal</li><li>• Body-suit removal</li><li>• Inner-glove removal</li><li>• Respirator removal</li><li>• Hand wash/rinse</li><li>• Face wash/rinse</li><li>• Shower ASAP</li><li>• Dispose of PPE in municipal trash, or contain for disposal</li><li>• Dispose of personnel rinse water to facility or sanitary sewer, or contain for offsite disposal</li></ul>	<ul style="list-style-type: none"><li>• Wash/rinse equipment</li><li>• Solvent-rinse equipment</li><li>• Contain solvent waste for offsite disposal</li></ul>	<ul style="list-style-type: none"><li>• Power wash</li><li>• Steam clean</li><li>• Dispose of equipment rinse water to facility or sanitary sewer, or contain for offsite disposal</li></ul>

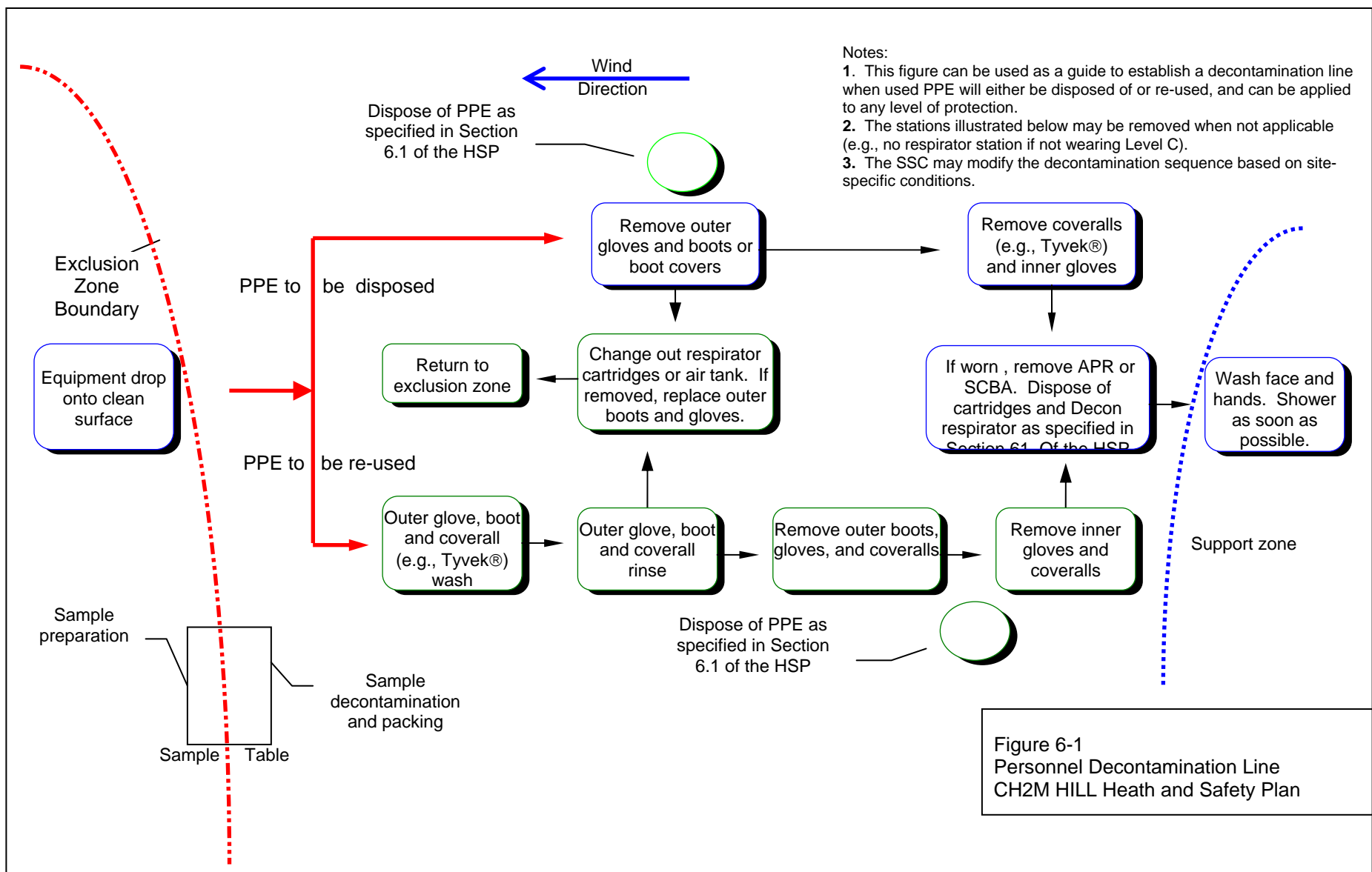
### 6.2 Diagram of Personnel-Decontamination Line

No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones. The SSC should establish areas for eating, drinking, and smoking. Contact lenses are not permitted in exclusion or decontamination zones.

Figure 6-1 illustrates a conceptual establishment of work zones, including the decontamination line. Work zones are to be modified by the SSC to accommodate task-specific requirements.

## 7 Spill-Containment Procedures

Sorbent material will be maintained in the support zone. Incidental spills will be contained with sorbent and disposed of properly.



## 8 Site-Control Plan

### 8.1 Site-Control Procedures

(Reference CH2M HILL SOP HS-11, *Site Control*)

- The SSC will conduct a site safety briefing (see below) before starting field activities or as tasks and site conditions change.
- Topics for briefing on site safety: general discussion of Health and Safety Plan, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, emergencies.
- The SSC records attendance at safety briefings in a logbook and documents the topics discussed.
- Post the OSHA job-site poster in a central and conspicuous location in accordance with CH2M HILL SOP HS-71, *OSHA Postings*.
- Establish support, decontamination, and exclusion zones. Delineate with flags or cones as appropriate. Support zone should be upwind of the site. Use access control at entry and exit from each work zone.
- Establish onsite communication consisting of the following:
  - Line-of-sight and hand signals
  - Air horn
  - Two-way radio or cellular telephone if available
- Establish offsite communication.
- Establish and maintain the “buddy system.”
- Initial air monitoring is conducted by the SSC in appropriate level of protection.
- The SCC is to conduct periodic inspections of work practices to determine the effectiveness of this plan – refer to Sections 2 and 3. Deficiencies are to be noted, reported to the HSM, and corrected.

### 8.2 Hazwoper Compliance Plan

(Reference CH2M HILL SOP HS-19, *Site-Specific Written Safety Plans*)

Certain parts of the site work are covered by state or federal Hazwoper standards and therefore require training and medical monitoring. Anticipated Hazwoper tasks (Section 1.1.1) might occur consecutively or concurrently with respect to non-Hazwoper tasks. This section outlines procedures to be followed when approved activities specified in Section 1.1.2 do not require 24- or 40-hour training. Non-Hazwoper-trained personnel also must be trained in accordance with all other state and federal OSHA requirements.

- In many cases, air sampling, in addition to real-time monitoring, must confirm that there is no exposure to gases or vapors before non-Hazwoper-trained personnel are allowed on the site, or while non-Hazwoper-trained staff is working in proximity to Hazwoper activities. Other data (e.g., soil) also must document that there is no potential for exposure. The HSM must approve the interpretation of these data. Refer to subsections 2.5 and 5.3 for contaminant data and air sampling requirements, respectively.
- When non-Hazwoper-trained personnel are at risk of exposure, the SSC must post the exclusion zone and inform non-Hazwoper-trained personnel of the:
  - nature of the existing contamination and its locations
  - limitations of their access
  - emergency action plan for the site
- Periodic air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-Hazwoper-trained personnel (e.g., in an adjacent area) are not exposed to airborne contaminants.
- When exposure is possible, non-Hazwoper-trained personnel must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to health and safety hazards.
- Remediation treatment system start-ups: Once a treatment system begins to pump and treat contaminated media, the site is, for the purposes of applying the Hazwoper standard, considered a treatment, storage, and disposal facility (TSDF). Therefore, once the system begins operation, only Hazwoper-trained personnel (minimum of 24 hour of training) will be permitted to enter the site. All non-Hazwoper-trained personnel must not enter the TSDF area of the site.

## 9 Emergency Response Plan

(Reference CH2M HILL, SOP HS-12, *Emergency Response*)

### 9.1 Pre-Emergency Planning

The SSC performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with CH2M HILL onsite parties, the facility, and local emergency-service providers as appropriate.

- Review the facility emergency and contingency plans where applicable.
- Determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Determine what offsite communication equipment is needed (e.g., nearest telephone, cell phone).
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel.
- Field Trailers: Post “Exit” signs above exit doors, and post “Fire Extinguisher” signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- Designate one vehicle as the emergency vehicle; place hospital directions and map inside; keep keys in ignition during field activities.
- Inventory and check site emergency equipment, supplies, and potable water.
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, and releases.
- Rehearse the emergency response plan before site activities begin, including driving route to hospital.
- Brief new workers on the emergency response plan.

The SSC will evaluate emergency response actions and initiate appropriate follow-up actions.

### 9.2 Emergency Equipment and Supplies

The SSC should mark the locations of emergency equipment on the site map and post the map.

Emergency Equipment and Supplies	Location
20 LB (or two 10-lb) fire extinguisher (A, B, and C classes)	Support Zone/Heavy Equipment
First aid kit	Support Zone/Field Vehicle
Eye Wash	Support & Decon Zone/Field Vehicle
Potable water	Support & Decon Zone/Field Vehicle
Bloodborne-pathogen kit	Support Zone/Field Vehicle
Additional equipment (specify):	N/A

### 9.3 Incident Response

In fires, explosions, or chemical releases, actions to be taken include the following:

- Shut down CH2M HILL operations and evacuate the immediate work area.
- Notify appropriate response personnel.
- Account for personnel at the designated assembly area(s).
- Assess the need for site evacuation, and evacuate the site as warranted.

Instead of implementing a work-area evacuation, note that small fires or spills posing minimal safety or health hazards may be controlled.

### 9.4 Emergency Medical Treatment

The procedures listed below may also be applied to non-emergency incidents. Injuries and illnesses (including overexposure to contaminants) must be reported to Human Resources. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the CH2M HILL medical consultant. During non-emergencies, follow these procedures as appropriate.



- Notify appropriate emergency response authorities listed in Section 9.8 (e.g., 911).
- The SSC will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury.
- Initiate first aid and CPR where feasible.
- Get medical attention immediately.
- Perform decontamination where feasible; lifesaving and first aid or medical treatment take priority.
- Make certain that the injured person is accompanied to the emergency room.
- When contacting the medical consultant, state that the situation is a CH2M HILL matter, and give your name and telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.
- Report incident as outlined in Section 9.7.

## 9.5 Evacuation

- Evacuation routes and assembly areas (and alternative routes and assembly areas) are specified on the site map.
- Evacuation route(s) and assembly area(s) will be designated by the SSC before work begins.
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation.
- The SSC and a “buddy” will remain on the site after the site has been evacuated (if safe) to assist local responders and advise them of the nature and location of the incident.
- The SSC will account for all personnel in the onsite assembly area.
- A designated person will account for personnel at alternate assembly area(s).
- The SSC will write up the incident as soon as possible after it occurs and submit a report to the Corporate Director of Health and Safety.

## 9.6 Evacuation Signals

Signal	Meaning
Grasping throat with hand	Emergency-help me.
Thumbs up	OK; understood.
Grasping buddy's wrist	Leave area now.
Continuous sounding of horn	Emergency; leave site now.

## 9.7 Incident Notification and Reporting

- Upon any project incident (fire, spill, injury, near miss, death, etc.), immediately notify the PM and HSM. Call emergency beeper number if HSM is unavailable.
- For CH2M HILL work-related injuries or illnesses, contact and help Human Resources administrator complete an Incident Report Form (IRF). IRF must be completed within 24 hours of incident.
- For CH2M HILL subcontractor incidents, complete the Subcontractor Accident/Illness Report Form and submit to the HSM.
- Notify and submit reports to client as required in contract.

## 10 Approval

This site-specific Health and Safety Plan has been written for use by CH2M HILL only. CH2M HILL claims no responsibility for its use by others unless that use has been specified and defined in project or contract documents. The plan is written for the specific site conditions, purposes, dates, and personnel specified and must be amended if those conditions change.

### 10.1 Original Plan

**Written By: Jayson Burkard**

**Date: November 20, 2007**

---

**Approved By: Michael Goldman**

**Date: November 21, 2007**

---

### 10.2 Revisions

**Revisions Made By:**

**Date:**

---

**Revisions to Plan:**

---

**Revisions Approved By:**

**Date:**

---

## 11 Attachments

- Attachment 1: **Employee Signoff Form – Field Safety Instructions**
- Attachment 2: **Project-Specific Chemical Product Hazard Communication Form**
- Attachment 3: **Chemical-Specific Training Form**
- Attachment 4: **Emergency Contacts**
- Attachment 5: **Project H&S Forms/Permits**
- Attachment 6: **Project Activity Self-Assessment Checklists**
- Attachment 7: **Applicable Material Safety Data Sheets**

**EMPLOYEE SIGNOFF FORM****Health and Safety Plan**

- The CH2M HILL project employees and subcontractors listed below have been provided with a copy of this HSP, have read and understood it, and agree to abide by its provisions.

**Project Name:** Supplemental Remedial Investigation, Tulsa Fuel and Manufacturing      **Project Number:** 365672

<b>EMPLOYEE NAME</b> (Please print)	<b>EMPLOYEE SIGNATURE</b>	<b>COMPANY</b>	<b>DATE</b>
Jayson Burkard			
Chuck Dougherty			
Rebecca Wrobel			
Roger Gomez			
Zeb Anderson			
Amber Guilfoyle			
Aleeca Forsberg			



**CHEMICAL-SPECIFIC TRAINING FORM**

Location: Project # : 365672

HCC: Trainer:

**TRAINING PARTICIPANTS:**

NAME	SIGNATURE	NAME	SIGNATURE

**REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:**


The HCC shall use the product MSDS to provide the following information concerning each of the products listed above.

- ☐ Physical and health hazards
- ☐ Control measures that can be used to provide protection (including appropriate work practices, emergency procedures, and personal protective equipment to be used)
- ☐ Methods and observations used to detect the presence or release of the regulated product in the workplace (including periodic monitoring, continuous monitoring devices, visual appearance or odor of regulated product when being released, etc.)

Training participants shall have the opportunity to ask questions concerning these products and, upon completion of this training, will understand the product hazards and appropriate control measures available for their protection.

Copies of MSDSs, chemical inventories, and CH2M HILL's written hazard communication program shall be made available for employee review in the facility/project hazard communication file.

## Emergency Contacts

### 24-hour CH2M HILL Emergency Contact – 800/756-1130

#### Medical Emergency – 911

Facility Medical Response #: 918/371-1000  
Local Ambulance #: 918/371-1031

#### CH2M HILL Medical Consultant

Dr. Peter Greaney  
GMG WorkCare, Orange, CA  
800/455-6155  
(After hours calls will be returned within 20 minutes)

#### Fire/Spill Emergency -- 911

Facility Fire Response #: 918/371-1000  
Local Fire Dept #: 918/371-1020

#### Local Occupational Physician

#### Security & Police – 911

Facility Security #: 918/371-1000  
Local Police #: 918/371-1000

#### Corporate Director Health and Safety

Name: Keith Christopher  
Phone: 703/331-1113

#### Utilities Emergency

Water: 918/371-1010  
Gas: 918/371-1010  
Electric: 918/371-1010

#### Health and Safety Manager (HSM)

Name: Michael Goldman  
Phone: 770/331-3127

#### Designated Safety Coordinator (DSC)

Name: Jayson Burkard  
Phone: 314/477-7284

#### Regional Human Resources Department

Name: Jennifer Plauche  
Phone: 770/604-9182

#### Project Manager

Name: Tim McDonald  
Phone: 918/344-3767

#### Corporate Human Resources Department

Name: John Monark/COR  
Phone: 303/771-0900

#### Federal Express Dangerous Goods Shipping

Phone: 800/238-5355

#### CH2M HILL Emergency Number for Shipping Dangerous Goods

Phone: 800/255-3924

#### Worker's Compensation and Auto Claims

Sterling Administration Services  
Phone: 800/420-8926 After hours: 800/497-4566

Report fatalities AND report vehicular accidents involving pedestrians, motorcycles, or more than two cars.

Contact the Project Manager. Generally, the Project Manager will contact relevant government agencies.

#### Facility Alarms: None

**Evacuation Assembly Area(s):** Parking Lot of Faith Fellowship Church, immediately North of TFM site.

**Facility/Site Evacuation Route(s):** Evacuation route varies, depending upon location of work within and around the city of Collinsville.

**Hospital Name/Address:** St. John Owasso Hospital

**Hospital Phone #:** 918/274-5000

### Directions to Hospital

START **A** **Collinsville, OK, United States**

FINISH **B** **12451 E 100th St N, Owasso, OK 74055, United States**

Total Distance: 6.3 miles, Total Time: 11 mins (approx.)



Show Cumulative Distance

Distance

Action



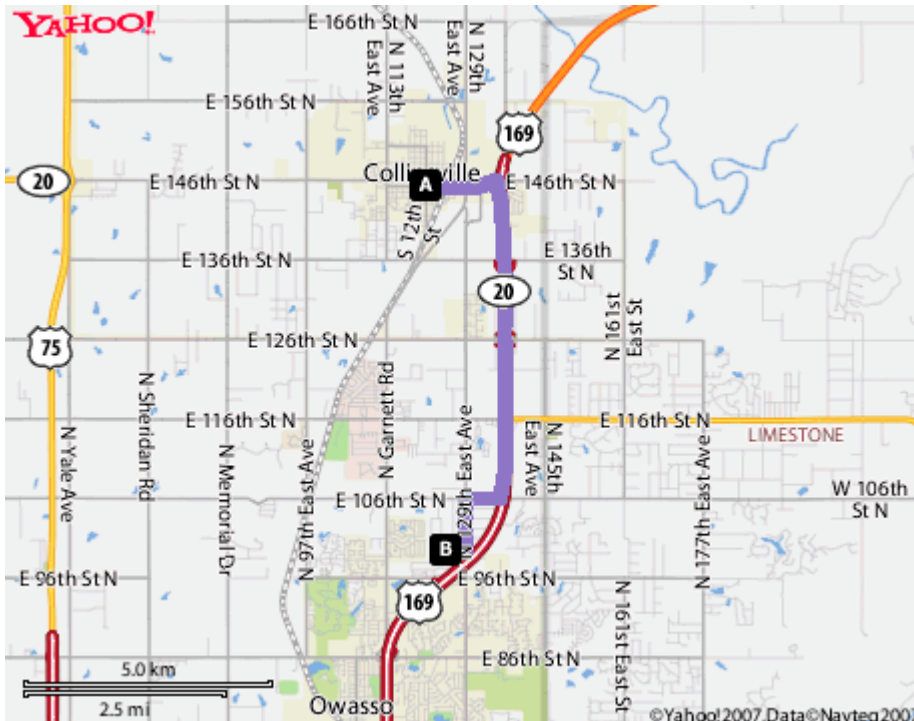
### COLLINSVILLE, OK, UNITED STATES

1. Starting in **COLLINSVILLE, OK** on **N 12TH ST** go toward **S 12TH ST** go **< 0.1 mi** < 0.1 mi
2. Turn **L** **LEFT** on **W MAIN ST(OK-20)** go **0.8 mi** 0.8 mi
3. Continue to follow **OK-20** go **0.1 mi** 0.9 mi
4. Turn **R** **RIGHT** to take ramp onto **US-169 S** toward **OK-20 E** go **3.7 mi** 4.6 mi
5. Take the **E. 106TH ST N.** exit go **0.4 mi** 5.0 mi
6. Turn **R** **RIGHT** on **E 106TH ST N** go **0.4 mi** 5.4 mi
7. Turn **L** **LEFT** on **N 129TH EAST AVE** go **0.6 mi** 6.0 mi
8. Turn **R** **RIGHT** on **E 100TH ST N** go **0.2 mi** 6.2 mi
9. Arrive at **12451 E 100TH ST N, OWASSO**, on the **R** **RIGHT**



**12451 E 100TH ST N, OWASSO, OK 74055, UNITED STATES**

Distance: 6.3 miles, Time: 11 mins







# **CH2M HILL HEALTH AND SAFETY PLAN**

## **Attachment 5**

### **Project H&S Forms and Permits**

# **CH2M HILL HEALTH AND SAFETY PLAN**

## **Attachment 6**

### **Project Activity Self-Assessment Checklists**

# **CH2M HILL HEALTH AND SAFETY PLAN**

## **Attachment 7**

### **Applicable Material Safety Data Sheets**